CHAPTER 2 – DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW OF ALTERNATIVES DEVELOPMENT

This chapter provides a detailed description of the Desert Harvest Solar Project (DHSP) and associated facilities, including a generation interconnection line (gen-tie line) proposed by EDF Renewable Energy (EDF or Applicant) and alternatives to the proposed project. The Applicant's objective for the DHSP is to construct and operate a 150-megawatt (MW) renewable solar energy generating facility. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and renewals of the applicable permits, approvals and authorizations for the DHSP (which renewals would be subject to future discretionary agency action).

The BLM has identified a full range of reasonable alternatives to analyze in this EIS. This EIS analyzes the potential environmental impacts of twelve alternatives for the project and its components: one no action alternative, two no project alternatives, four solar facility alternatives, one no gen-tie alternative, and four gen-tie alternatives as follows:

- Alternative 1: No Action (No Plan Amendment)
- Alternative 2: No Project Alternative (with Plan Amendment to Find the Site Suitable for Solar Energy Development)
- Alternative 3: No Project Alternative (with Plan Amendment to Find the Site Unsuitable for Solar Energy Development)
- Alternative 4: Proposed Solar Project
- Alternative 5: Solar Project Excluding WHMA
- Alternative 6: Reduced Footprint Solar Project
- Alternative 7: High-Profile Reduced Footprint Solar Project
- Alternative A: No Gen-Tie
- Alternative B: Proposed Gen-Tie (Shared Towers)
- Alternative C: Separate Transmission Towers within Same ROW
- Alternative D: Cross-Valley Alignment
- Alternative E: New Cross-Valley Alignment

The alternatives identified during the screening process include those proposed by the Applicant as part of the design of the Proposed Action, those proposed by the BLM as part of environmental review, and ideas for potential alternatives suggested by cooperating agencies and the public during the EIS scoping period. The alternatives that responded to the purpose and need for the proposed project and are otherwise reasonable (as described in Section 6.6.1 (Reasonable Alternatives) of the BLM NEPA Handbook (H-1790-1)), are carried forward in the EIS for full analysis. Those that did not are eliminated from further detailed analysis and are discussed briefly in Section 2.17. In order to have a complete action alternative, the authorized officer could choose any one of the solar generation facility action alternatives, Alternative 4 through 7, and any one of the gen-tie action alternatives, Alternative B through Alternative E. For a complete no-project alternative, the deciding official could choose either Alternative 2: No Project Alternative (with

Plan Amendment to Find the Site Suitable for Solar Energy Development) or Alternative 3: No Project Alternative (with Plan Amendment to Find the Site Unsuitable for Solar Energy Development) with Alternative A: No Gen-Tie. For a complete no-action alternative the deciding official could choose Alternative 1: No Action and Alternative A: No Gen-Tie.

Technical information about the project presented in this chapter was provided by the Applicant. All numbers referring to land disturbance, equipment, schedule, mileage, and workforce are based on the most up-to-date engineering available from the Applicant. These numbers generally represent conservative estimates for purposes of analyzing impacts. In response to public and government agency input, the Applicant is continuing to evaluate project design and construction methods to determine whether potential environmental impacts can be further reduced. If so, any impacts dependent on the project disturbance area, equipment used, and schedule estimates may be further reduced based on the final engineering and permit requirements for the project components. The Applicant's information was provided primarily in the revised Plan of Development for the DHSP, submitted on April 26, 2011 to the BLM, and on the Applicant's responses to BLM data requests (enXco 2011a-e).

This chapter provides information on the proposed solar facility (Section 2.5) and solar facility alternatives (Sections 2.2, 2.3, 2.4, 2.6, 2.7, and 2.8), the proposed gen-tie line (Section 2.10) and gen-tie alternatives (Sections 2.9 and 2.11 through 2.13), a summary comparison of effects by alternative (2.14), the agency preferred alternative (2.15), and the California Environmental Quality Act (CEQA) environmentally superior alternative (2.16) and the alternatives considered but eliminated (Section 2.17).

2.1.1 CEQA Alternatives

Under CEQA, an EIR is required to identify and assess reasonable alternatives that have the potential to avoid or minimize the impacts of a project. The State CEQA Guidelines require consideration of the No Project Alternative (Section 15126.6(e)) and selection of a range of reasonable alternatives (Section 15126.6(d)). The EIR must adequately assess these alternatives to allow for a comparative analysis for consideration by decision-makers. The State CEQA Guidelines (Section 15126.6(a)) state that:

> *An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.*

The applicant's CEQA objectives are listed in Section 1.3. The alternatives detailed in Section 2.2 through 2.17 would comply with CEQA's requirements for the project alternatives.

2.1.2 Connected or Cumulative Actions

Connected actions are defined by the BLM Handbook H-1790-1 as those actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(1)). Actions are connected if they automatically trigger other actions that may require an EIS; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are

interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(i, ii, iii)). Connected actions are limited to actions that are currently proposed (ripe for decision). There are no connected actions for the EIS.

Cumulative actions are defined by the BLM NEPA Handbook H-1790-1 as proposed actions which potentially have a cumulatively significant impact together with other proposed actions and "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(2)). Cumulative actions are identified in Section 4.1 of this EIS, which includes the cumulative geographic scope for each issue evaluated in this EIS, and identifies the relevant reasonably foreseeable future projects relevant to each resource for purposes of the cumulative effects analysis.

2.2 ALTERNATIVE 1: NO ACTION (NO PLAN AMENDMENT)

Under NEPA, the No Action Alternative is used as a benchmark of existing conditions by which the public and decision makers can compare the environmental effects of the Proposed Action and the alternatives. Under Alternative 1, the DHSP would not be approved (all components of the project would be denied), no ROW grant would be issued, and no CDCA Plan amendment would be approved to make the land available for large-scale solar development.

This No Action Alternative does not preclude future solar development on the project location; therefore, it is possible that another project proponent would submit a ROW application to the BLM for use of the site for solar generation or other land uses. The solar generation portion of the site is currently within BLM Land Use Class M, which allows a wide variety of uses such as mining, livestock grazing, recreation, energy, and the development of new utility facilities.

2.3 ALTERNATIVE 2: NO PROJECT ALTERNATIVE (WITH PLAN AMENDMENT TO FIND THE SITE SUITABLE FOR SOLAR ENERGY DEVELOPMENT)

With this No Project Alternative (with Plan Amendment to Find the Site Suitable for Solar Energy Development), the DHSP would not be approved (all components of the project denied), no ROW grant would be issued to the Applicant, and the CDCA Plan would be amended to find the project area, or based on resource conflict only a portion of it, suitable for solar energy development.

With such an amendment, a similar solar project could be proposed on the project site. Project impacts associated with such a future project would be analyzed at the time a project is proposed through submission of a ROW application. As these impacts from such a future project are not foreseeable, they are not analyzed in the No Project Alternative (with Plan Amendment to Find the Site Suitable for Solar Energy Development).

2.4 ALTERNATIVE 3: NO PROJECT ALTERNATIVE (WITH PLAN AMENDMENT TO FIND THE SITE UNSUITABLE FOR SOLAR ENERGY DEVELOPMENT)

With this No Project Alternative (with Plan Amendment to Find the Site Unsuitable for Solar Energy Development), the DHSP would not be approved (all components of the project denied), no ROW grant would be issued to the Applicant, and the CDCA Plan would be amended to find the project area unsuitable and unavailable for large-scale solar energy development.

This alternative would not place a special designation or level of protection on the project site. If the project study area were not available for large-scale solar development, it would still remain available for other types of uses allowable on BLM land.

2.5 ALTERNATIVE 4: PROPOSED SOLAR PROJECT

The following section describes Alternative 4: Proposed Solar Project, including the project structures and facilities, construction, operations, and decommissioning activities, and Applicant Measures. Applicant Measures (AM) are considered design features and performance commitments by the Applicant, and are incorporated into the project design. All AMs for the proposed solar project and gen-tie line (see Table 2-5) would be required for solar facility Alternatives 4, 5, and 6, and gen-tie line Alternatives B, C, D, and E.

2.5.1 Proposed Amendments to the CDCA Plan

BLM authorization of a ROW grant for Alternative 4, 5, 6 or 7 would require a CDCA Plan Amendment. The Plan Amendment would identify the project study area suitable and available for large-scale solar energy development.

2.5.2 Actions or Elements Common to All Action Alternatives

Solar facility Alternative 4, Alternative 5, and Alternative 6 would all be located in the same geographic area, on BLM-administered land north of Desert Center in Riverside County (see Figure 2-1, Project Overview Map, in Appendix A). The alternatives would use the same solar technology, and would require the same structures and components, including an operations and maintenance (O&M) facility, an electrical collection system, an on-site substation, a switchyard, site security, fencing, and lighting, access roads, a reverse osmosis system and water wells, a concrete batch plant, and an electrical interconnection. Details of each of these components are provided in Section 2.5.4, Structures and Facilities, and would be the same for Alternatives 4, 5, and 6. A majority of the information provided in Section 2.5.4 would also apply to Alternative 7, aside from the overall height of the panels. Construction, operation, and decommissioning activities for the solar facility alternatives would be the same for Alternative 4, 5, 6, and 7. Any differences in construction, operation, and decommissioning activities for the solar facility alternatives have been identified in the sections that follow.

Alternatives 4, 5, 6, and 7 (and Alternatives B, C, D, and E, described in Sections 2.10 through 2.13) would all require an amendment to the CDCA plan to find the project area suitable and available for large-scale solar energy development. The following amendments would be made to the CDCA Plan:

- The addition of the following text for the solar facility site: "Site approved for solar generation per the Desert Harvest Solar Project Final Environmental Impact Statement and Proposed California Desert Conservation Area Plan Amendment (2012)."
- The addition of the following text for the gen-tie line: "Permission granted to construct outside of a designated utility corridor per the Desert Harvest Solar Project Final Environmental Impact Statement and Proposed California Desert Conservation Area Plan Amendment (2012)."
- Reference to the approved alternative solar facility and approved alternative gen-tie alignment per Figure 2-1 (Appendix A) of this Final EIS.

2.5.3 Overview

Alternative 4 would be a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project that would be expected to produce a minimum of 240,000

megawatt-hours per year[1] (MWh/y) with a net capacity factor of 16 to 18 percent.[2] The project would be located on lands administered by the BLM, Palm Springs-South Coast Field Office in Riverside County, 5 miles north of Desert Center. The project would be located on 1,208 acres, and would be comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres. Figure 2-2 in Appendix A illustrates Alternative 4.

2.5.4 Structures and Facilities

The structures and facilities presented in the following sections are based on the most up-to-date information available. However, the project disturbance area, equipment used, and schedule estimates may be reduced and/or modified consistent with this analysis based on the final engineering and permit requirements for the project components.

The proposed solar facility would consist of several main components:

- Main generation area—PV arrays, switchyard, inverters, overhead lines, and access corridors;
- O&M Facility – either on or off site;
- On-site electrical substation and switch gear; and
- Site security, fencing, and lighting.

Table 2-1 presents a breakdown of site acreage for each solar facility component.

Table 2-1. Estimated Overall Project Acreage

Project Component	Temporary (acres)[1]	Permanent (acres)[1]
Current BLM right-of-way case record (Northern Parcel / Southern Parcel; respectively)	1,208 (1,053 / 155)	1,208 (1,053 / 155)
Solar panel field	1,200	1,200
Parking and administration areas	3.0	3.0
Access corridors for maintenance vehicles	250	250
Construction laydown area (to be converted to access road at end of construction)	(10)	0
Gravel access roads for the circulation of emergency vehicles	10	10
On-site substation	3	3
Area permanently covered by at-grade items (footprint of piles, power conversion station, transformer, PV combining switchgear, on-site substation, on-site overhead line poles, O&M Facility)	10	10
Water storage ponds	2	1
Approximate maximum area shaded by PV modules	1,000	1,000
Area outside of BLM right-of-way disturbed by trenching for solar facility	11	0
Total Disturbance	1,219	1,208

1 - Disturbance acreages shown are not additive.

[1] The number of megawatt-hours per year is a measure of the system's energy, which is the amount of power generated by the system during a year.

[2] The net capacity factor of a power plant is the ratio of the actual output of a power plant over a period of time and its potential output if it had operated at full nameplate (rated) capacity the entire time.

PV Panels and Generation Area

The project may use a variety of PV technologies, including, but not limited to:

- Crystalline silicon panels
- Copper indium gallium selenide panels

As discussed in Section 2.5.5, the Applicant would use construction site preparation techniques that prepare the site for safe and efficient installation and operation of PV arrays. The Applicant proposes to use site preparation techniques that would minimize the required volume of earth movement, including a "disc and roll" technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level, as well as "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. The solar field would cover 1,208 acres in extent and 100 percent of the solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres to 260 acres. Installed panels would shade up to an estimated 1,000 acres of the solar facility acreage.

If a tracking system is used for the PV modules, either high-profile or low-profile trackers could be used. Tracking systems have a motor that rotates the PV modules from east to west during the day to track the sun across the sky. The low-profile system is analyzed for Alternatives 4 through 6, and the high-profile system is analyzed for Alternative 7. With a low-profile tracking system, each panel would be up to 6 feet high. The solar field would cover the majority of the project area, as shown in Figure 2-3 in Appendix A. The field of panels consists of repeating blocks of 1.44 MW (alternating current [AC]). The approximate dimensions of an array block consist of 12,480 panels, separated into four quadrants (northwest, southwest, northeast, southeast). Within each quadrant, there would be 6 rows of 10 or 11 48-panel strings. Each block would employ two 720 kW inverters, set along the access roads, in the middle of the panel array area. Figure 2-4 in Appendix A illustrates a typical low-profile photovoltaic array, and Figure 2-5 in Appendix A illustrates a typical array configuration. Figure 2-6 in Appendix A shows typical module specifications, and Figure 2-7 in Appendix A shows typical tracker specifications.

The panel field would be laid out by installing vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. A preliminary walk-through by civil engineers suggests that this foundation would be sufficient to meet geotechnical requirements for wind stability. Site-specific soil tests would be required to validate the preliminary engineering. If tests conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Between each 720 kW power block would be 14- to 26-foot-wide roads running east-to-west, and 14-foot-wide roads running north-south to allow fire and vehicular access for the maintenance of the electrical facilities.

Operations and Maintenance Facility

The Applicant's preference is to use an existing commercial or industrial building in the project vicinity for ongoing O&M facilities. Currently, the Applicant is evaluating the feasibility of

using an existing building within 10 miles of the project site, with existing county road access. The specific building that would be used has not been identified. This O&M facility would accommodate offices for up to 8 staff, a parts storage area, plant security systems, and project monitoring equipment

If an onsite O&M facility were required, it would be located next to the project substation, at the northwest corner of the site (see Figure 2-3 in Appendix A). The building would consist of a 120-foot-wide by 240-foot-long (an estimated 0.7 acres) prefabricated building set on concrete slab-on-grade poured in place. The building would be an estimated 19 feet tall at its highest point. The facility would be designed for project security, employee offices, and parts storage. The structure would accommodate up to 8 personnel, subject to the applicable accessibility requirements.

Electrical Collection System

The PV modules would be electrically connected by wire harnesses and combiner boxes that would collect power from several rows of modules and feed the project's power conversion stations via direct current (DC) cables placed in underground covered trenches. DC trenches would be an estimated 3 feet deep and from 1.5 to 2.5 feet wide. The bottom of each trench would be filled with clean fill surrounding the DC cables and the remainder of the trench would be back-filled with native soil and compacted to 90 percent (95 percent when crossing under roadways). Power screeners may be used on site for a period of time (less than one year) to extract the required clean fill from native soils excavated during trenching for use as bedding material in the trenches. A power screener is a motorized piece of equipment that uses moving screens to filter soils to a particular granularity. Use of this equipment has been included in the air quality analysis.

Each power conversion station comprises an inverter located within an enclosure and connected to a transformer. The PV inverters would convert the DC electric input into grid-quality AC electric output. The AC electrical output would be transmitted from the power conversion station to the adjacent transformer. The transformer would step up the voltage of the AC electrical input and then would transmit the power via underground lines in covered trenches to the PV combining switchgear. AC trenches would be an estimated 3 feet deep and from 8 inches to 6.5 feet wide, depending on the number of cables buried adjacent to one another, and would also be used to house fiber optic cables. The bottoms of the trenches would be filled with sand surrounding the fiber optic cables, and the remainder of the trench would be back-filled with native soil and compacted. The PV combining switchgear would transmit the power to overhead lines within the solar facility site; the overhead lines would transmit the electrical output to the on-site substation. At the on-site substation the voltage would be stepped up to 220 kV and routed via a new gen-tie line to the approved Southern California Edison (SCE) Red Bluff Substation. The alternative gen-tie line alignments (Alternatives B through E) are described in Sections 2.10 through 2.13. A power conversion station and transformer would be located within each PV array. The power conversion station enclosures would be an estimated 11.5 feet tall. The transformers would be an estimated 6.3 feet tall. The transformer would be placed on a pre-cast concrete pad. Each pad would be delivered by flatbed truck during construction, in combination with a power conversion station vault, and installed by crane from the truck.

Each PV combining switchgear would collect the power from a number of arrays. The PV combining switchgear cabinets would be an estimated 7.5 feet tall and would be dispersed amongst the arrays. Each PV combining switchgear would be placed on pre-cast 32-foot by 14.5-foot concrete pads, delivered and installed in the same manner as transformer pads and power conversion station vaults.

High-capacity 34.5 kV collection system lines would connect the power output from the PV combining switchgear to the on-site substation via overhead lines. These overhead lines would be supported by wooden poles an estimated 52 feet above finished grade. The overhead lines would span a distance of an estimated 150 feet from pole to pole. The on-site electrical collection system would be designed to minimize electrical losses within the solar facility site prior to delivery to the on-site substation.

Because the project site is on two separate parcels, electrical connection between the southern parcel and on-site substation would be required. The Applicant would construct either an underground or overhead connection for a distance of 3,000 feet between the electrical power conversion stations on the southern and northern parcels. The overhead alternative could involve reconductoring (upgrading) an existing SCE distribution line; however, the details of this potential reconductoring cannot be known at this time, prior to completion of interconnection studies for the project. Any disturbance associated with reconductoring would be expected to occur on previously disturbed access roads and would not be expected to result in visual changes. The underground connection would run along an easement on the eastern side of Kaiser Road. The route would parallel an existing natural gas line adjacent to Kaiser Road. Construction of the line would occur concurrently with construction of the project's gen-tie line, using the same equipment and personnel. For an underground connection, trenching would be 3 to 6 feet wide. Temporary disturbance would be up to 75,000 square feet and trenching would disturb 18,000 square feet within the disturbance footprint.

One or more meteorological stations would be installed at the solar facility site prior to construction in order to track weather patterns. The meteorological station(s) would be attached to the data acquisition system to collect data for analysis and system monitoring. The meteorological station(s) would be 6 feet in height and would be set on a stainless-steel tripod base an estimated 10 feet by 10 feet.

On-Site Substation

The project substation would be located in the northwest corner and would cover an estimated 5 acres (see Figure 2-3 in Appendix A). Figure 2-8 in Appendix A depicts the electrical plan for the on-site substation. At the on-site substation, the voltage of the solar-generated electricity would be stepped up to 220 kV. The project's primary access road would serve the on-site substation.

Switch gear

Electrical switch gear serves to interconnect an electrical generator to the grid. The switch gear would be constructed and operated by the Applicant. The project switch gear would occupy an area an estimated 400 feet long and 400 feet wide in the west corner of the northern parcel immediately adjacent to the substation and within the fenceline. Surge arresters at the high-voltage bushings would protect the transformer(s) from surges caused by lightning or other disturbances.

The transformer(s) would be set on a concrete pad within a containment area designed to hold any accidental releases of transformer oil. All transformers would be free of polychlorinated biphenyls. The high-voltage side of the transformer(s) would be connected to the plant's switchyard.

A small control building would be located nearby the switch gear and would be accessible to authorized high-voltage personnel only. The building would house electrical control equipment, battery/DC systems for device operation, safety relays, and other similar electrical equipment. This building would interconnect with the main control room in the operations building for monitoring of the substation.

Site Security, Fencing, and Lighting

Site security is critical for the Applicant due to the high value of the solar panels used in construction of the project, and for the safety of personnel and the public. At the onset of construction, site access would be controlled for personnel and vehicles. A security fence, which would also be the permanent fence, would be installed around the plant site boundary. At this time, all required laydown areas are expected to be contained within the defined solar facility boundaries, and thus no additional temporary fencing would be required. In addition, security would be enhanced with motion detectors, facility lighting, and cameras in key locations. Exterior lighting would comply with current Title 24 regulations from the State of California. Security would be maintained as required by the engineering, procurement, and construction (EPC) contractor or a suitable subcontractor to maintain public safety and the security of the facilities.

Security fencing would be erected around the entire perimeter of the project area, with an access gate immediately north of the substation prior to beginning construction. An emergency gate would be located in the southeast corner, with access to Beekley Road (north of Rice Road, west of Carr Road). The site perimeter fence would be 8 feet high and have an overall height of no more than 10 feet from the bottom of the fabric to the top barbed wire. The fence would have top rail, bottom tension wire, and three strands of barbed wire mounted on 45 degree extension arms. Posts would be set in concrete.

Controlled access gates would be located at the entrance to the facility, immediately north of the substation (see Figure 2-8 in Appendix A). Site gates would be swing or rolling access gates. Access through the main gate would require an electronic swipe card, preventing unaccompanied visitors from accessing the facility or construction area. All visitors would be logged in and out of the facility during normal business hours. Visitors and non-employees would be allowed entry only with approval from a staff member of the facility, or from the BLM. Between 1 and 3 security personnel would be located on the project site during the daytime operation hours of 7am to 5pm. If an on-site O&M facility is used, security personnel would be located on-site at all times. Visitors would be issued passes that are worn during their visit and returned to the main office when leaving.

Except as provided below, lighting during construction would be limited to the staging area for the construction trailers, parking area, and site security facilities. Lighting would be located on temporary service poles an estimated 18 feet in height. Power would come from a connection to the local distribution system or from an on-site generator. If required, construction lighting would be limited to that needed to ensure safety. It would be focused downward, shielded, and

directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operations, lighting would be limited to shielded, area-specific lighting for security purposes for the on-site substation. Power for lights would come from the local distribution system. Service lighting would be placed in key safety-sensitive areas, such as the switchyard of the on-site substation. The level and intensity of lighting during operations would be the minimum needed for security and safety purposes. Security lights would use motion sensor technology that would be triggered by movement at a human's height. There would be no lights around the project perimeter, in order to minimize the project's visual impact on surrounding receptors and roads. Sensors on the security fencing would alert security personnel of possible intruders. Lights on the site would be shielded and focused downward and toward the interior of the site to minimize lighting impacts on the night sky and to neighboring areas. Portable lighting may be used occasionally and temporarily for maintenance activities during operations.

Access Roads

The primary point of access to the project site would be a 20 foot-wide access road connecting the northwest corner of the solar facility to Kaiser Mine Road.

Access within the project area would be provided by 14 to 26 foot-wide unpaved, ungraveled roads running east-west, and 14 foot-wide roads running north-south that would be cleared, graded, and covered with aggregate and compacted to 90 percent to allow fire and maintenance vehicle access. Gravel and/or aggregate would be sifted from on-site soil or obtained from a BLM-approved commercial quarry within 2 miles of the project site. The total length of on-site roads would be up to 109 miles, and the total area that would be covered by roads would be 210 to 260 acres. Roads are shown on Figure 2-3 in Appendix A.

Reverse Osmosis System and On-Site Wells

The proposed solar facility proposes to draw water from two new and/or existing local wells to meet construction water demands, one of which would continue to be used for project operations. Both wells would be available for use during construction to provide flexibility in the water supply and in the event of a well malfunction.

The potential locations for the construction of two new on-site wells are at the northeastern and northwestern areas of the project site, as depicted in Figure 2-1 in Appendix A. As an alternative to new wells, DHSP may use nearby (within 10 miles) off-site active wells that have a reported individual (per well) production capacity of between 800 and 2,200 acre-feet per year (BLM 2011). If off-site wells are used, water would be trucked to the on-site water treatment facility described below. No new roads would be required and no new ground disturbance would occur as a result of using off-site wells. Off-site well locations are depicted on Figure 2-1 in Appendix A.

The Applicant would perform the necessary studies and secure the necessary permit(s) to install the well(s). In addition, sampling and analysis in accordance with established protocols and with appropriate analytical test methods would be performed to assess water sufficiency and quality at each active well of appropriate capacity. An analysis of impacts of project water consumption on water availability in the Chuckwalla Groundwater Basin is provided in Section 4.22.

A water treatment facility and demineralization evaporation pond are required to treat well water containing total dissolved solids (TDS). At this time, it is not known whether the groundwater at the project site contains high levels of TDS. Because panel washing requires water with very low TDS, a water treatment system consisting of a double-pass reverse osmosis (RO) system may be installed near the main O&M well, most likely adjacent to the on-site project substation. The water treatment facility would be enclosed in a small structure and would be an estimated 6 feet wide by 12 feet deep and an estimated 6 feet high. The facility would consist of three flexible PVC hoses: one input hose from the well water source, two output hoses with demineralized water going to the water trucks or tanks, and the reject water going to the demineralization evaporation pond. This system would produce up to an estimated 20 gallons per minute (gpm) of low-TDS water and an estimated 9 gpm of reject water. This reject water would be piped to a lined evaporation pond with four sections comprising an estimated 1 acre total. Residue would be periodically removed from the ponds and disposed of at an approved facility. The Applicant would re- purpose one of the construction holding ponds described in Section 2.5.5, Construction Water Requirements and Sources as a settling pond for RO reject water.

Concrete Batch Plant

During construction, existing commercial ready-mix concrete supply would be used where feasible. If unavailable, a temporary, two-acre concrete batch plant would be installed in the construction laydown area. The concrete source materials would be purchased from a commercial source. The batch plant would be removed at the end of the construction period.

Electrical Interconnection

The proposed gen-tie line to interconnect the project to the electrical grid is described in Section 2.10.

Telecommunications Equipment

Telecommunication equipment for the project site will reside within the on-site substation structure. All fiber optic communication lines necessary to support the on-site telecommunication equipment would be located on the same poles used to support the gen-tie line. The communication lines would originate from the on-site project substation and terminate in the utility substation into the SCE communication equipment at the Red Bluff Substation.

If an offsite O&M building is used, wireless equipment would be installed at the O&M building with line-of-site wireless communication to the on-site project substation. Data, voice and other telecom packets would be sent from the substation to the O&M building and substation. The onsite telecom equipment would be located on a pole or lattice structure up to 19 feet high.

2.5.5 Construction Activities

Construction Schedule and Phasing

Construction is anticipated to commence during the 2nd quarter of 2013, and continue through the 3rd quarter of 2015, in three phases. Commercial operation would also be phased and the first phase of operation would commence during the 2nd quarter of 2014, with commercial operation of the final phase commencing during the 3rd quarter of 2015. The construction schedule would be as follows:

- Phase 1 Construction: April 2013 to July 2013 (3 months)
- Phase 2 Construction: September 2013 to November 2014 (14 months)
- Phase 3 Construction: November 2014 to May 2015 (6 months)

Construction of Phase 1 would include pre-construction surveys, exclusion fencing around a 10-acre area in the northwest corner of the DHSP site, desert tortoise exclusion (if tortoise are present), clearing and construction of a laydown yard, parking area, and pad mounts for transformers.

Construction of Phase 2 would include site fencing, installation of temporary power, site grading and preparation over a 1,043-acre area, construction of the O&M building (if necessary) and on-site roads, construction of the on-site wells, construction of the project substation and switch-yard, and assembly and installation of panel blocks and wiring for 137 MW of solar power.

Construction of Phase 3 would include site grading and preparation over a 155-acre area, assembly and installation of panel blocks and wiring for 13 MW of solar power. Panel blocks would not be installed within the FERC exclusion area crossing the southern parcel (see Figure 2-3a in Appendix A for more detail).

Construction would generally occur 2 hours before sunrise and 2 hours after sunset, Monday through Friday. Additional hours may be necessary to correct Desert Harvest Solar schedule deficiencies or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier to avoid pouring concrete during high ambient temperatures. During the startup phase of the project, some activities may be performed over the weekend.

Site Access and Circulation

Access to the northern portion of the project site would be from the existing Kaiser Mine Road along the western boundary of the project area. This road is off of Rice Road, which has an on-ramp/off-ramp to Interstate 10 at Desert Center. A lane for truck turn-off will be required on Kaiser Mine road, and new roads would be required within the project area. Components would be delivered by this road, on a schedule to be determined by the EPC contractor. Access to the southern portion of the project site would be from Kaiser Mine Road as well. Please see Figures 2-3a and 2-3b in Appendix A for more details on the access roads, including access across the FERC exclusion area.

Worker access would be controlled through a locked entrance gate in the west corner of the northern project area.

As noted above, access within the project area would be provided by 14- to 26-foot-wide unpaved, ungraveled roads running east-west, and 14-foot-wide graveled roads running north-south that would be cleared, graded, and covered with aggregate and compacted to 90 percent to allow fire and maintenance vehicle access. Gravel and/or aggregate would be sifted from on-site soil or obtained from a BLM-approved commercial quarry within 6 miles of the project site.

Construction Workforce

The on-site workforce would consist of laborers, craftsmen, supervisory personnel, supply personnel, and construction management personnel. The maximum number of on-site personnel is

250 individuals at any one time. An average workforce of 100 is anticipated. The construction workforce would largely be recruited from within Riverside and San Bernardino Counties from Applicant-hosted job fairs.

Typical construction work schedules are expected to be 8 hours per day Monday through Friday. Typically, the work day would consist of one shift beginning as early as 7:00 a.m. and ending as late as 7:00 p.m. The work schedule may be modified throughout the year to account for the changing weather conditions (e.g., starting the work day earlier in summer months to avoid work during the hottest part of the day for health and safety reasons.)

Construction Waste Management

Portable bathrooms would be provided on-site during construction and would be emptied in an approved off-site facility; domestic wastewater generated during construction would not be disposed of on-site.

Construction Vehicles and Equipment

During construction, the tonnage delivered would be on the order of 15,000 tons of equipment and materials. Table 2-2 provides an estimate of the total truck deliveries, and Table 2-3 lists the number and types of construction vehicles required. In addition to what is shown in Tables 2-3 and 2-4, the peak number of construction-related automobile trips would be up to 446 one-way trips per day[3] and the average annual construction-related automobile trips is estimated to be 178 one-way trips per day (89 round trips).

Table 2-2. Estimated Truck Deliveries

Item	Truck Deliveries	Vehicle Type	Axles	Deliveries per Day	Duration (months)
Modules	2488	53' Flatbed	5	10-12	17
Foundation posts	435	48' Flatbed	5	3-4	15
Racking	550	48' Flatbed	5	3-4	15
Cable	57	53' Flatbed	5	0-1	10
Inverters	104	48' Flatbed	5	0-1	17
Transformer	1	53' Flatbed	5	0-1	1
Concrete	165	Concrete mixer	3	3-5	9
BLM-approved road base	500	Dump truck	3	10-12	8
Trash (haul off)	60	40-YD roll-off	3	1-2	26
Fencing	25	48' Flatbed	5	0-2	4
Electrical equipment	40	48' Flatbed	5	0-2	26

[3] Assumes 30 percent carpool rate.

Table 2-3. Construction Vehicles Required

Item	Units	Duration of Use (hrs/day)	Duration (months)	Purpose
Water truck	3	8	25	Dust control
Front end loader	3	8	25	Material movement
Scrapers	5	8	14	Grading
Bulldozers	2	8	14	Grading
Graders	5	8	14	Grading
Hydraulic Ram	10	8	20	Foundation installation
Forklifts	8	8	26	Material staging
Backhoes	8	8	20	Excavation
Crane	2	10-12	17	Inverter placement
Tractor - with trailer	6	8	25	Material staging
Pickup truck	30	10-12	26	Transportation
ATV	40	10-12	26	Transportation
Pile driver	10	8	20	Post installation
Trencher	2	8	20	Underground work (AC/DC/Fiber trenching)
Small sheepsfoot roller	4	6	20	Compaction
Power screener	3	6	14	Soil processing
Cable plow	1	8	20	Underground cable installation

Site Preparation, Surveying, and Staking

Site preparation would begin shortly after final permitting is complete. Final surveying, to accommodate existing ROW grants and setback requirements for Kaiser Road, and the gas ROW along the eastern portion of the road, would precede any site work. Surveying would be completed by a California licensed land surveyor. The surveyor would stake the edges of the project area prior to erection of the security fencing.

Security fencing would be put in place in sequence with project phasing.

Vegetation Removal and Treatment

Once fencing is erected, site preparation would consist of removing vegetation within the project area by scarification where necessary; for example, along the access roads. An estimated 10 percent of the entire project area would be scarified to remove vegetation on all the access roads between the 1.44 MW rows of solar panels. In addition, any vegetation over 18 inches would be removed to avoid interaction with the solar panels. Annuals and smaller perennials would remain.

Preparation would likely proceed by section, so that only the portion of the project area where panels would be laid out over a period of six months would be scarified at any one time.

Key considerations for vegetation treatment of the site would include:

- Soil disturbance in support of construction would increase the possibility of introduction of invasive species. Regular monitoring and weed management would be required during construction. Ongoing maintenance in the solar field may include treatment of noxious weeds by targeted spraying with common formulations of the herbicide glyphosate, which is a herbicide approved for use on BLM lands in California in the Record of Decision on the 2007 *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM 2007).

- Where temporary access is needed to install facilities, such as along the perimeter fencing, no removal of existing vegetation or grading would occur. Instead, equipment would drive over or around existing desert scrub vegetation without direct removal. Crushed vegetation is much more likely to show a rapid recovery than where vegetation is removed and reseeded, or where soils are disturbed. The Applicant is not expecting that final plans would require any disturbance outside the final perimeter fencing and internal engineered berms.
- Revegetation with native species would be implemented where feasible in areas of temporary disturbance.

The Applicant would implement an Integrated Weed Management Plan (IWMP) that describes non-native, noxious, or invasive weed species that occur or are likely to occur at the site and prescribes management actions to monitor and eradicate specified species. As described in Section 1.9.1 (Relationship of the Proposed Action to BLM Policies, Plans, and Programs), the IWMP and the use of herbicides for the proposed project tiers off of the BLM's 2007 *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (Herbicide PFEIS) and Record of Decision (ROD). The Draft IWMP is included in Appendix C.10 of this EIS and specifies that weed management would be consistent with approved herbicides, protocols, and standard operating procedures from the Herbicide PFEIS. The Draft IWMP is presented in Appendix C-10.

The IWMP would include weeding, annual pruning, and soil monitoring if necessary. Weeding would occur frequently during the initial growth period to ensure that invasive plants do not mature and set seed. Weeding activities would follow the approved WMP. Once the native plant species are established, weeding frequency would likely be able to drop to less frequent levels.

Vegetation would be allowed to re-grow within the solar panel field. It would not be allowed to grow too high (above 18 inches) underneath the panels, or it may grow into electrical connections and create a fire hazard, or disrupt the panel's performance. However, this is relatively unlikely given the shading the panels would be providing on the soil. At a minimum, the access roads in the photovoltaic field would be maintained free from significant vegetation through the use of targeted herbicide spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

Solar Array Assembly and Construction

The panel field would be constructed as follows. After the site is prepared, and graded to the limited extent required, the panel field would be laid out by installing the vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. A preliminary walk-through by civil engineers suggests that this foundation would be sufficient to meet geotechnical requirements for wind stability. Soil tests would be required to validate the preliminary engineering. If tests conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts. Once the foundations are secure, trenching would be dug along the perimeter of the 1.44 MW units, to tie the inverter blocks together, and the electrical conduit and wires would be laid down. Next, the framing would be bolted to the vertical support beams. Once framing is complete, panels would be delivered on-site and installed on the frames. Finally, the pre-poured concrete inverter pads would be delivered and laid down. Lastly, the inverters would be secured to the pads, and the electrical wiring would be completed.

The laydown area is shown Figure 2-3 in Appendix A as Phase 1. In general, material delivery for the solar field would maintain a constant flow, and panels and framing structures would be delivered throughout the solar field adjacent to the 1.44 MW subunit locations. These areas would be subsumed by the solar field as it is built out. Construction would proceed in an assembly-line fashion as each task is completed throughout the solar field.

During construction, electric power for construction activities would be derived from the distribution lines that run along the southern side of the project site, or by mobile generators. Up to five mobile generators would be used that would be located at the laydown area (at the northwest corner of the site). Each generator would produce 60 dB(A) of noise at 23 feet.

Gravel, Aggregate, and Concrete Requirements and Sources

Gravel would be required for the north-south access roads (not for the less often used east-west routes) within the project area and would be sifted from on-site soil or trucked to the site from a BLM-approved commercial mine located 6 miles from the project site. Road aggregate required for the on-site access roads would amount to 17,500 cubic yards.

Concrete would be required for the inverter pads and the switchyard. Concrete for the inverter pads and vertical H-pile supports, if needed, would be pre-poured and transported to the site by truck. A temporary, two-acre concrete batch plant would be installed in the construction laydown area. The Applicant would purchase the concrete batch plant source materials from a commercial source approximately 6 miles from the project site.

Construction Water Requirements and Sources

During the 24-month construction period, an estimated 400 to 500 acre-feet of water per year (for a total of 800 to 1000 acre-feet) would be needed for such uses as soil compaction, dust control, and sanitary needs for construction workers, depending on the configuration selected. The majority of the construction water use would occur during site grading operations. The daily water demand during construction of the project is estimated to range from a low of 125,000 gallons per day (gpd) to a peak of an estimated 600,000 gpd. The project's maximum well extraction rate over any 24-hour period is not expected to exceed 880 gallons per minute. Drinking water would be provided from an off-site commercial source during construction. Water requirements for the project are shown in Table 2-4.

Table 2-4. Water Requirements of the Solar Project

Water Consumption Requirements	Approximate Consumption during Construction	Approximate Consumption during Operation
Daily (gallons per day)	200,000–500,000	N/A
Annual (acre-feet/year)	400–500	26.02-39.02

Temporary construction ponds would be used for water storage at various locations around the site at locations depicted on Figure 2-3 in Appendix A. Use of temporary ponds rather than relying entirely on stand tanks and water trucks would reduce the amount of vehicle travel around the site by water trucks (and associated exhaust and dust), reduce the rate of groundwater extraction during construction, and also improve capability to respond quickly and effectively to mitigate fugitive dust emissions caused by unexpected high wind events.

A total of three temporary water storage ponds are planned around the project construction site. It is anticipated that each pond would occupy an estimated three-quarters of an acre and would hold an estimated 21.5 million gallons. The ponds would be connected to supply wells and would involve 6-inch HDPE pipe runs along on-site access roads or the solar facility site perimeter from the wells to the ponds. Two or three ponds would be operating at any one time; one pond would be open for every roughly 400 acres that are actively undergoing site preparation activities at any one time. The temporary ponds would be an estimated 6 to 8 feet deep and would be fenced and lined for safety. The temporary ponds would be covered with netting to deter ravens and would be designed, constructed, and operated to comply with all applicable regulatory requirements with respect to design, operation and maintenance, protection of migratory waterfowl, and raven management. To minimize earth work, most of the ponds would be co-located with planned retention basins that would be used during project operation to contain storm water runoff. Storm water pollution prevention BMP controls would be incorporated with the retention basins.

The ponds would be filled by pumps running 24 hours per day at up to 600 gallons per minute. A float valve in each pond would control overflow. Water would be pumped from the pond into large temporary storage tanks (stand tanks) using hurricane pumps. Water would be transferred directly to trucks from the stand tanks, as needed for dust control and compaction during construction.

2.5.6 Operations and Maintenance Activities

Maintenance Activities

Vegetation treatment would be required to keep the site free of noxious weeds. At a minimum, the access roads in the photovoltaic field would be maintained free of larger plants through the use of targeted spraying, occasional scarifying, or weeding to reduce fire hazard, and allow access to the panel arrays.

Roads would be maintained to minimize fugitive dust and prevent erosion from rain events. Additional gravel or surface treatments such as "seament" on the dirt access roads may be required.

Other maintenance that would be performed in conjunction with the routine maintenance includes but is not limited to:

- Torque electrical fittings
- Clean switch gear
- Calibrate protective relays
- Fire protection system test and annual certification
- Fuse swapping, testing ground fault detection and power quality

Operations Workforce and Equipment

Staffing

Management personnel would provide technical oversight/guidance in four critical areas: overall plant management, plant operations and maintenance, and human resources, accounting, and administration. The project would employ up to 8 full-time staff during operations.

No replacement/rotations of plant personnel are projected during this period. If the need for such a rotation arises, necessary arrangements would be coordinated with the owner on a case-by-case basis.

Between 1 and 3 security personnel would be located on the project site. If the O&M building is located on-site, security personnel would be on-site 24 hours per day. If the O&M building is offsite, security personnel would be located at the operations and maintenance facility during evening hours and early mornings, likely between 5:00 p.m. and 7:00 a.m., depending on the season. The project site would be monitored by remote cameras, motion detectors and perimeter security alarms. In the event that any of these methods detected an event at the project site, security personnel would be deployed for an onsite inspection.

Staff Training and Safety

The operator would pursue an on going training program in accordance with the Applicant's Training Manual. The main goal of this manual is to ensure that the O&M staff remains fully competent in the safe, reliable, and efficient operation, maintenance, and administration of the plant.

Operations Equipment

Facilities would be maintained by 4 diesel engine pickup trucks. These would be used for accessing the site and delivering equipment and crews for maintenance activities. Maintenance vehicles would travel to the site daily from an off-site O&M building (within 10 miles of the site) or an optional on-site building. Panel washing would occur up to 3 times annually during operations, and water would be trucked to the site in up to 1,173 water truck trips annually from a nearby commercial location (within 10 miles of the solar facility site).

Operational Water Requirements and Sources

During operation, water would be required for solar panel watering two to three times per year. If off-site wells are used, water would be trucked to the project site from up to 10 miles away in up to 1,200 5,000- to 10,000-gallon water trucks annually during project operations for the purpose of panel washing. Panel wash water would be purified using the on-site reverse osmosis system, which is described in detail in Section 2.4.4. A permanent, above-ground 5,000 gallon water storage tank would be used for O&M tasks and facilities, including on-site fire-fighting. The water tank would be up to 13 feet (159 inches) in height and would be located on a concrete slab up to 11 feet (140 inches) in diameter. The total water used would be between 18 and 27 acre-feet per year.

Domestic wastewater would be treated and disposed at the site using a septic disposal system consisting of septic tanks and leach field permitted by Riverside County Health District. The specifications for the septic system would be determined by engineering code and County permit requirements. Water requirements of the solar project are shown in Table 2-4.

Aviation Lighting

The Applicant anticipates no aviation restrictions for this photovoltaic plant because all structures would be lower than the 200-foot height standard that triggers Federal Aviation Administration Part 77 Obstruction Evaluation Consultation.

2.5.7 Decommissioning Activities

Site Closure and Reclamation Activities

The minimum expected operational lifetime of Desert Harvest Solar is 30 years; however, depending on economic or other circumstances, the real life of the project could be longer or shorter. The project's lifetime could be 50 years or more with equipment replacement and repowering.

In case of a temporary closure of the facilities, the BLM and any other responsible agencies would be notified. If temporary closure involves the threat or actual release of hazardous substances, procedures would be implemented from the Hazardous Materials Business Plan, as developed for the project. Procedures would include but not be limited to the following:

- Practices to control any release of hazardous materials
- Applicable notifications of responsible agencies and the public
- Emergency response procedures

When permanent closure is appropriate, a decommissioning plan would be developed and submitted to the BLM for review and approval. Procedures would be designed to ensure public health and safety, environmental protection and compliance with all applicable laws, ordinances, regulations, and standards. Closure may range from short-duration closure to complete removal of equipment and restoration of the land to BLM-approved specifications. The procedures for decommissioning are designed to ensure public health and safety, environmental protection, and compliance with applicable regulations. It is assumed that decommissioning would begin 30 to 50 years after commercial operation date of the solar plant.

Decommissioning would generally include the following goals:

- Provide the BLM with a detailed Decommissioning Plan. BLM has the authority to require that the project area is restored to its natural state, including removing all above and below ground structures, foundations, cement, and any other items.
- Remove above and below ground structures unless converted to other BLM-approved uses
- Restore the lines and grades in the disturbed area to match the natural gradients of the site
- Re-establish native vegetation in the disturbed areas
- Comply with applicable laws, ordinances, regulations, and standards and local/regional plans
- Secure funding for decommissioning and restoration

The proposed strategy to achieve the above goals could include the following:

- Analyze alternatives other than full restoration of the site (for instance, removal of old facilities and upgrading to newer solar technology)
- Use industry standard demolition means and methods to decrease personnel and environmental safety exposures by minimizing time and keeping personnel from close proximity to actual demolition activities to the extent practical
- Plan components of decommissioning to ensure personnel and environmental safety are maintained while efficiently completing the work

- Provide for recycling the components of the plant: metal, panels, concrete; and proper disposal of all other materials
- Remove all residual materials and chemicals from the site prior to demolition for reuse at other facilities or disposal at licensed facilities
- Demolition of below-ground facilities to a depth required for restoration of the native habitat
- Soils clean-up, if needed, particularly at locations where hazardous materials were used or stored to ensure that clean closure is achieved
- Restore the lines and grades in the disturbed area to match the natural gradients of the site and re-establish native vegetation in the disturbed areas

The first stage of dismantling the site would consist of removal and demolition of aboveground structures. The second stage would consist of dismantling and removing concrete structures so that no concrete remains within 3 feet of final grade, or as approved in the BLM approved Decommissioning Plan, and as appropriate. The third stage would involve removal of underground utilities within 3 feet of final grade, or as approved in the BLM approved Decommissioning Plan. The fourth stage would consist of excavation and removal of soils.

2.5.8 Design Features, BMPs, and Other Conditions Included in the Proposed Project

Table 2-5 describes those design features of the project that, when implemented as part of project construction or operation, would reduce or eliminate potential significant impacts of the project. Proposed project plans for Desert Harvest will be adapted based on project field studies.

Table 2-5. Applicant Measures

Air Resources	
AQ-1. Dust Control Plan	Applicant will develop and implement a dust control plan that includes the use of dust palliatives to ensure compliance with SCAQMD Rule 403. The dust control plan will focus on reducing fugitive dust from construction activities
AQ-2. Phased construction activity	Construction activity will be phased across the solar facility site in a manner that would minimize the area disturbed on any single day.
AQ-3. Minimize emissions from grading	Cut and fill quantities will be balanced across the solar facility site to minimize emissions from grading and to avoid the need to import fill materials or to remove excess spoil.
AQ-4. Transportation Plan	Applicant would require bidders for the construction contract to submit a transportation plan describing how workers would travel to the project site and how to encourage carpooling and alternative forms of transportation
Vegetation	
BIO-1. Habitat Compensation Plan	A Habitat Compensation Plan will be implemented by the Applicant to compensate for the loss of creosote desert scrub, desert dry wash woodland, and jurisdictional resources. Compensation will be accomplished by acquisition of mitigation land or conservation easements or by providing funding for specific land acquisition, endowment, restoration, and management actions under one of several programs, such as the mitigation program created by California Assembly Bill AB 13 in September, 2011. The Habitat Compensation Plan will be reviewed and approved by the BLM, USFWS, and CDFG. The precise details of the mitigation, including mitigation ratios, will be established in the BLM ROW grant, USFWS Biological Opinion, and any CDFG 2081 Incidental Take Permit or CDFG 2080.1 Consistency Determination.

Table 2-5. Applicant Measures

BIO-2. Integrated Weed Management Plan	A Draft Integrated Weed Management Plan (IWMP) will be prepared pursuant to BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007) and the National Invasive Species Management Plan (The National Invasive Species Council 2008), and will be implemented by the Applicant to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the project.
BIO-3. Preconstruction Surveys	Preconstruction Surveys for Special Status Plant Species and Cacti. Before construction, the Applicant will stake and flag the construction area boundaries, including the construction areas for the solar facility site, and gen-tie line; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A BLM-approved biologist will then survey all areas of proposed ground disturbance for special status plant species and cacti during the appropriate blooming period for those species having the potential to occur in the construction areas. All special status plant species and cacti observed will be flagged for transplantation. All cacti observed will be flagged for transplantation and special status plant species observed will be flagged for salvage.
BIO-4. Worker Environmental Awareness Program	Worker Environmental Awareness Program (WEAP). The Applicant will implement a WEAP to educate on-site workers about sensitive environmental issues associated with the project. The program will be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The program will be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure.
BIO-5. Vegetation Resources Management Plan	The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components: • A Vegetation Salvage Plan which discusses the methods that will be used to transplant cacti present within the project locations following BLM's standard operating procedures, as well as methods that will be used to transplant special status plant species that occur in the project locations if feasible. • A Restoration Plan which discusses the methods that will be used to restore creosote bush scrub and desert dry wash woodland habitat that is temporarily disturbed by construction activities. • The Vegetation Salvage Plan and Restoration Plan will specify success criteria and performance standards. BLM will be responsible for reviewing and approving the plan and for ensuring that the Applicant implements the plan including maintenance and monitoring required in the plan.
Wildlife	
BIO-6. Vegetation Measures	Implementation of Applicant Vegetation Measures would reduce impacts on wildlife as well. Where there is a conflict between provisions of the Mitigation Measures recommended for wildlife impacts and the following Applicant Measures, the Mitigation Measures take precedence.
BIO-7. Desert Tortoise Translocation Plan	A Draft Desert Tortoise Translocation Plan will be prepared for the project and will be implemented by the Applicant to ensure that construction monitoring will be conducted by a BLM-, USFWS-, and CDFG-approved biologists during all construction activities and that any desert tortoise found with the construction zone will be translocated to a suitable location outside of the project footprint. The final plan will conform to the 2010 USFWS desert tortoise relocation guidelines entitled Translocation of Desert Tortoise (Mojave Population) From Project Sites: Plan Development Guidance. Unpublished Report dated August 2010.
BIO-8. Bird and Bat Conservation Strategy and Contribution to Raven Management Program	The Applicant will contribute to the U.S. Fish & Wildlife Service (USFWS) Regional Raven Management Program by making a one-time payment of $105 per acre of project disturbance to the national Fish and Wildlife Federation Renewable Energy Action Team raven control account. A Draft Bird and Bat Conservation Strategy will be prepared and will be implemented by the Applicant to specify necessary actions to be taken to protect nesting bird and bat species, including burrowing owls, nesting birds, and roosting bats. The draft plan will be reviewed and approved by BLM. The final plan will conform to the USFWS Bird and Bat Conservation Strategy guidelines.
BIO-9. Water Storage Pond Design	Construction Water Storage Pond Design. The temporary construction water ponds will be designed, constructed, and operated in compliance with all applicable regulatory requirements with respect to design, operation, and maintenance, protection of migratory waterfowl, and raven management.
Climate Change	
CC-1. Reduce GHG Emissions	The third and fourth Applicant Measures proposed in the Air Resources section would help reduce greenhouse gas emissions in addition to reducing criteria pollutant emissions.

Table 2-5. Applicant Measures

Cultural Resources	
CULT-1. Monitoring and Mitigation Plan	A cultural resources monitoring and mitigation plan will be prepared for the project. The plan will include a description of areas to be monitored during construction, a discovery plan that will address unanticipated cultural resources, and provisions for the education of construction workers. Responsible parties for mitigation measures will be identified.
Geology and Soil Resources	
GEO-1. Design Plan	Project structures shall be built in accordance with the design-basis recommendations in the project-specific geotechnical investigation report. Structure designs must meet the requirements of all applicable federal, state, and county permits and building codes.
GEO-2. Design Features	The Applicant will implement the following design features to reduce impacts from wind and water erosion to soils: ■ Obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality Order 2009-0009 DWQ; ■ Use nonhazardous dust suppressants approved by the BLM and water on an as-needed basis to suppress wind-blown dust generated at the site during construction. Dust palliatives also would be applied between rows of solar panels for dust suppression during operation; ■ Implement erosion control measures during construction; and ■ Use silt fences for erosion control along neighboring properties and along the main drainage adjacent to the solar facility site.
Lands and Realty	
LU-1. Notification	Property owners within 300 feet of the project will be notified of all major project construction milestones, such as start of project construction. Said property owners will be provided with a detailed construction schedule at least 30 days before construction so that they are informed as to the time and location of disturbance. Updates will be provided as necessary.
Noise & Vibration	
N-1. Construction schedule	Most construction activity will be limited to daytime hours consistent with Riverside County noise ordinance limitations. Certain electrical connection activities at the solar project site would occur at night for safety reasons, but would not require any heavy equipment operations.
Public Health & Safety / Hazardous Materials	
HAZ-1. Spill containment and clean-up kits	Appropriate spill containment and clean-up kits will be kept on site during construction and maintained during the operation of the solar facility and gen-tie line.
HAZ-2. Hazardous Materials Management Plan.	In accordance with the Emergency Planning & Community Right to Know Act, the Applicant will supply the local emergency response agencies with a Hazardous Materials Management Plan and an associated emergency response plan and inventory specific to the site. The Applicant will prepare the plan for approval by the BLM and review and comment by the County of Riverside. The Applicant will be responsible for implementing the approved plan.
HAZ-3. BMPs for hazardous materials	During construction of the solar facility and gen-tie line, BMPs for handling, storing, and disposing of hazardous materials and waste will be followed.
HAZ-4. SPCC Plan	A Spill Prevention, Control, and Countermeasure Plan (SPCC) will be developed and implemented that would identify primary and secondary containment for oil products stored on site as well as training in spill management in the event of an unexpected release. The Applicant will prepare the plan for approval by the BLM. The Applicant will be responsible for implementing the approved plan.
HAZ-5. Env. Health and Safety Plan	The Applicant will develop an Environmental Health and Safety Plan for the construction and operation of the project to ensure it includes all activities and compliance with all local, state and federal regulatory requirements. Illness and Injury Prevention Programs will be developed for construction and operation. The Applicant will prepare the plan for approval by the BLM. The Applicant will be responsible for implementing the approved plan.
HAZ-6. Emergency Response and Inventory Plan	The Applicant will provide the County of Riverside with a project-specific Emergency Response and Inventory Plan before construction begins. The Applicant will prepare the plan for approval by the BLM and review and comment by the County of Riverside. The Applicant will be responsible for implementing the approved plan.

Table 2-5. Applicant Measures

HAZ-7. Fire Protection and other requirements	Project facilities will be designed, constructed, and operated in accordance with applicable fire protection and other environmental, health and safety requirements. In compliance with County of Riverside requirements, a project-specific fire prevention plan for both construction and operation of the solar facility and gen-tie line will be completed prior to initiation of construction. The fire protection plan will be approved by the BLM and provided to Riverside County for review and comment.
HAZ-8. Fire Prevention Plan	A project-specific fire prevention plan will be in place during construction, operation and decommissioning of the project. This plan will comply with applicable County of Riverside regulations and would be coordinated with the BLM Fire Management Officer and the local Fire Department in the Chuckwalla Valley at Tamarisk Park.
HAZ-9. Emergency Response Plan	An emergency response plan and site security plan will be completed for the project facilities by qualified professionals. These plans will be developed in accordance with the BLM requirements.
HAZ-10. Decommissioning Plan	When permanent closure is appropriate, a decommissioning plan would be developed and submitted to the BLM for review and approval. The following strategy would be taken: ■ Analyze alternatives other than full restoration of the site (for instance, removal of old facilities and upgrading to newer solar technology) ■ Use industry standard demolition means and methods to decrease personnel and environmental safety exposures by minimizing time and keeping personnel from close proximity to actual demolition activities to the extent practical ■ Plan components of decommissioning to ensure personnel and environmental safety are maintained while efficiently completing the work ■ Provide for recycling the components of the plant: metal, panels, concrete; and proper disposal of all other materials ■ Remove all residual materials and chemicals from the site prior to demolition for reuse at other facilities or disposal at licensed facilities ■ Demolition of below-ground facilities to a depth required for restoration of the native habitat ■ Soils clean-up, if needed, particularly at locations where hazardous materials were used or stored to ensure that clean closure is achieved ■ Restore the lines and grades in the disturbed area to match the natural gradients of the site and re-establish native vegetation in the disturbed areas
Socioeconomic and Environmental Justice	
S-1. Notification	The public will be notified of project activities and scheduling to inform the public of projected impacts on the surrounding area. This notification will provide the public with the opportunity to plan their personal and business activities appropriately.
S-2. Minimize visual impacts of gen-tie	Project Applicant will align gen-tie lines along existing linear features (such as Kaiser Road) to minimize the social effects of potential visual impacts.
Transportation and Public Access	
TR-1. Construction Traffic Control Plan	Project Applicant will prepare a Construction Traffic Control Plan in conjunction with Riverside County or Caltrans in accordance with Caltrans Manual on Uniform Traffic Control Devices and the California Joint Utility Traffic Control Manual (2010).
TR-2. Document road conditions	Project Applicant will document road conditions at the beginning and end of project construction and decommissioning and contribute fair share cost for pavement maintenance and other needed repairs.
TR-3. Share project information with airport owners	Project Applicant will share project information with the airport owners if a transmission line alternative that runs near the former Desert Center Airport's runway is selected to assure that no special precautions are needed.
TR-4. Coordinate with DoD	BLM will coordinate with the DoD R-2508 Complex Sustainability Office, Region IX, based in San Diego, California, and with local regional military installations regarding low-level flight operations relative to the project to assure that no special precautions are needed.

Table 2-5. Applicant Measures

Water Resources	
WR-1. Manage hazardous materials and use SPCC Plan	The Applicant or its agents will: ■ Train construction staff in the management of hazardous materials and use of spill control and cleanup equipment; ■ Have a clear chain of command within the organizational structure with responsibility for implementing, monitoring, and correcting BMPs; ■ Cover and contain hazardous materials so that they are not in contact with precipitation or runoff; ■ Store hazardous materials in one or more central areas, and institute rules requiring all hazardous materials to be secured at the end of the day; ■ Maintain good inventory records; store hazardous liquids and dispensing equipment in secondary containment; ■ Maintain adequate quantities of spill containment and response equipment at readily accessible points throughout the site; ■ Identify the worst case and most likely spill scenarios, and provide spill response equipment adequate to respond to these scenarios; ■ Use chemicals presenting the least environmental hazard wherever possible; ■ Store the smallest quantities of hazardous materials possible on the site; ■ Maintain site security to reduce vandalism; ■ Require all contractors to abide by the program BMPs and to identify any hazardous materials and specific BMPs pertaining to their trade or activity. ■ The SPCC Plan for the site would address storage of mineral oil contained in transformers. A SPCC Plan is required when 10,000 gallons or more of mineral oil in electrical equipment is contained on site, or when 1,320 gallons of petroleum is stored on the site, although an SPCC Plan can be voluntarily implemented for lesser quantities. The SPCC Plan would address methods and procedures for managing these products, lighting, security, containment requirements, training requirements, staff responsibilities for inspecting storage and dispensing equipment; and equipment and procedures for responding to a spill or release of stored petroleum products. ■ Riprap increases surface roughness and slows runoff velocities, decreasing sediment transport, and increasing flow depth. Riprap would be used in conjunction with decompaction, as riprap would not mitigate flow or volume. ■ Check dams can be constructed to address specific post-development hydraulic characteristics, if needed.

2.6 ALTERNATIVE 5: SOLAR PROJECT EXCLUDING WHMA

Alternative 5 would be constructed within the same project boundaries as Alternative 4, except that it would exclude the 47-acre portion of the site which is within the Palen-Ford Wildlife Habitat Management Area (WHMA), as shown on Figure 2-9, Alternative 5: Solar Project Excluding WHMA, in Appendix A. Alternative 5 would encompass an estimated 1,161 acres and the areas cleared of vegetation would be the same as for Alternative 4 (107 acres). Alternative 5 would be an estimated 145 MW nominal capacity project, which would generate a minimum of 230,000 MWh/y with a net capacity factor of 16 to 18 percent. The area permanently covered by at-grade items would also remain the same as with Alternative 4: 10 acres. Project details are provided in Section 2.5.4 (Structures and Facilities) for Alternative 4. Construction, operation and maintenance, and decommissioning information is provided in Sections 2.5.5 through 2.5.7.

2.7 ALTERNATIVE 6: REDUCED FOOTPRINT SOLAR PROJECT

Alternative 6 would be constructed within the same project boundaries as Alternative 4 except that it would exclude the 155-acre southern parcel of the project and a small (9 acre) portion of the northern parcel that contains a sensitive plant species, crucifixion thorn, as shown on Figure 2-10, Alternative 6: Reduced Footprint Solar Project, in Appendix A. Alternative 6 would not exclude the portion of the site that is within the Palen-Ford WHMA. Alternative 6 would encompass an estimated 1,044 acres and would be an estimated 125 to 135 MW nominal capacity

project, which would generate a minimum of 200,000 MWh/y with a net capacity factor of 16 to 18 percent. The areas cleared of vegetation would be slightly less than for Alternative 4, an estimated 100 acres. The area permanently covered by at-grade items would also be slightly reduced from Alternative 4, less than 10 acres. Project details are provided in Section 2.5.4 (Structures and Facilities) for the Alternative 4. Construction, operation and maintenance, and decommissioning information is provided in Sections 2.5.5 through 2.5.7. Because Alternative 6 would not require use of two separate parcels of land, the alternative would not require an underground electrical connection.

2.8 ALTERNATIVE 7: HIGH-PROFILE REDUCED FOOTPRINT SOLAR PROJECT

Alternative 7 would be constructed within the same project boundaries as Alternative 6, as shown on Figure 2-10, Alternative 6: Reduced Footprint Solar Project, in Appendix A. Alternative 7 would encompass an estimated 1,044 acres and would be an estimated 125–135 MW nominal capacity project, which would generate a minimum of 260,000 MWh/y with a net capacity factor or 22 to 26 percent. Project details are provided in Section 2.5.4 (Structures and Facilities), with the only exception being the overall height of the panels for Alternative 7. Alternative 7 would use high-profile single-axis tracking panels that would have a total height of 15 feet, as shown in Figure 2-11 in Appendix A. Construction, operation and maintenance, and decommissioning information is provided in Sections 2.5.5 through 2.5.7. Because Alternative 7 would not require use of two separate parcels of land, the alternative would not require an underground electrical connection.

2.9 ALTERNATIVE A: NO GEN-TIE

This No Gen-Tie Alternative under NEPA defines the scenario that would exist if the proposed gen-tie line were not constructed and no new or additional plan amendment was issued. If this No Gen-Tie Alternative is selected, the construction and operational impacts of the gen-tie line would not occur. There would be no disturbance of the ground at the tower locations and pull sites, no disturbance of desert vegetation and habitat, and no installation of transmission equipment. This No Gen-Tie Alternative would also eliminate any contributions to cumulative impacts on environmental resources. This No Gen-Tie Alternative is inherent in the solar project no action and no project alternatives (Alternatives 1 through 3), but is introduced to provide a no action baseline for evaluating the potential environmental impacts of the gen-tie action Alternatives B through E.

2.10 ALTERNATIVE B: PROPOSED GEN-TIE LINE (SHARED TOWERS)

As shown in Figure 2-12 in Appendix A, the proposed gen-tie, Alternative B, would utilize transmission infrastructure developed for the Desert Sunlight Solar Farm (DSSF) project by sharing the approved transmission towers for the Desert Sunlight Project. For the EIS, the environmental baseline, also known as the "affected environment" is the existing physical conditions at the time that environmental analysis commences, or September of 2011. As such, the baseline is the existing physical environment in the Chuckwalla Valley, with the approved Desert Sunlight gen-tie that has not yet been constructed. For the purposes of the NEPA analysis, Alternative B would therefore constitute the construction and operation of a transmission line along the approved alignment for the Desert Sunlight Solar Farm's gen-tie line. Portions of the proposed gen-tie line would not be located in a designated utility corridor (see figure 2-1). However the CDCA Plan would be amended to grant permission to construct outside utility corridor.

2.10.1 Actions or Elements Common to All Action Alternatives

The gen-tie line Alternatives B, C, D, and E would share elements. The transmission support structures would be identical for each alternative. Similarly the types of construction activities would be the same for each activity, although the location and specific engineering requirements would differ based on the existing conditions along the ROW. Details regarding the tower selections, construction operation, and decommissioning activities is provided in Section 2.10, Alternative B: Proposed Gen-Tie (Shared Towers) and are applicable for Alternatives C, D, and E. Any differences in construction, operation, and decommissioning activities for the alternatives have been identified in the sections that follow.

Applicant Measures (AM) are considered design features and performance commitments by the Applicant, and are incorporated into the project design. All AMs for the proposed gen-tie line (see Table 2-5) would be required for Alternatives B, C, D, and E.

2.10.2 Overview

Alternative B would involve construction, operation, and eventual decommissioning of a 220 kilovolt (kV) transmission generation tie (gen-tie) line, which would begin on the west side of the solar project site, turn south along the west side of Kaiser Road, turn east just north of Desert Center, and run south across I-10 to the Red Bluff Substation. Along Kaiser Road, the center of the 160-foot transmission line ROW would be located an estimated 120 to 130 feet from the centerline of the paved roadbed, within the county road ROW on BLM land. One mile south of Oasis Road, the line would turn east, running along the north side of the section lines dividing BLM-managed land from private land. After 0.7 miles, the line would turn southeast for 0.7 miles, due east for 3.5 miles, then south for 0.8 miles to the Red Bluff Substation. Alternative B would align parallel and to the south of an existing BLM open route, along BLM-administered land. The same access road would be used for maintenance of both the Desert Harvest and Desert Sunlight gen-tie lines and the gen-tie lines would be maintained concurrently using the same maintenance service provider.

Of the 12.1-mile ROW, 11.4 miles would be on BLM land (with 6 of these miles within a federally designated utility corridor), 0.6 miles would be on land owned in fee by MWD and 0.5 miles would be on land owned in fee by Riverside County. The Applicant would enter into a land license agreement, lease, or permanent easement with MWD for the portions on land owned in fee by MWD, and would rely on this EIS to satisfy the CEQA obligations of MWD. Riverside County would issue an Encroachment Permit for the portions on land owned in fee by the County and for access into the County road ROW, in addition to issuing a Public Use Permit for the MWD- and privately owned lands.

The 160-foot-wide corridor and additional fan-shaped areas at corners used for wire stringing for Alternative B would encompass 256 acres. The total length of Alternative B would be 12.1 miles. The elevation of the Alternative B alignment varies from 690 to 833 feet above mean sea level. An estimated 73 transmission structures would be required for this alternative, including 65 tangents and 8 dead-ends. Five splicing locations and 20 guard structures would be used during construction. Permanent access roads would be constructed in order to provide access for maintenance of the gen-tie, as needed. Table 2-6 provides a list of major gen-tie components, along with the acreage required for each component.

Table 2-6. Alternative B – Description of Components

Project Facility or Component	Dimensions	Percent of Gen-Tie Corridor
Gen-tie line corridor	Width: 160 feet plus additional fan-shaped areas at corners Length: 12.1 miles ROW Area: up to 256 acres	100
Permanent disturbance (within corridor)	92 acres	35.9
Total transmission structure footprint	2,743 square feet (0.06 acres)	< 0.1
Individual transmission structure footprint	Tangent structure: 28.3 square feet; dead-end: 113.1 square feet	< 0.1
Permanent access roads	Width: 14 feet Length: 7.3 miles 12.4 acres	4.8
Temporary access roads	Width: 14 feet Length: 13.1 miles 22.2 acres	8.7

The Applicant would use steel monopoles for the gen-tie line, the same as the approved Desert Sunlight gen-tie poles; see Figures 2-13a and 2-13b in Appendix A. Poles are expected to be 135 feet tall. Typical spans between poles would be 900 to 1,100 feet. Self-weathering steel would be used for the monopoles, which are intended to blend with the surrounding mountains. The ultimate depth of excavation for poles would depend on detailed geotechnical studies; typical excavation depths for poles of this voltage range from 20 to 30 feet below ground surface.

Based on the project requirements, access, terrain, and limited available geotechnical information, it is expected that direct embedded foundations would be used for tangent structures, and anchor-bolted drilled shaft foundations for angle and dead-end structures. Vibrated casing foundations may also be used, depending on the results of planned further geotechnical investigation.

Telecommunication Equipment

As described for Alternative 4, telecommunication equipment for the solar facility would be located within the on-site substation structure. All fiber optic communication lines necessary to support the on-site telecommunication equipment would be located on the same poles used to support the gen-tie line and would be installed concurrently with the gen-tie line. The communication lines would originate from the on-site project substation and terminate into the SCE communication equipment at the Red Bluff substation.

2.10.3 Construction Activities

Construction of Alternative B would cause both temporary and permanent disturbance within a construction corridor estimated at a width of 160 feet, plus additional fan-shaped areas at each turn in the alignment with radii of 450 feet needed for wire stringing. The permanent disturbance associated with Alternative B would be limited to the foundations of the transmission structures, the footprint of the access road, and two 75-foot by 200-foot areas associated with each fan-shaped stringing area, as described previously.

Preconstruction Surveys

Preconstruction survey work would consist of preconstruction biological clearance surveys, staking structure locations, and flagging the ROW.

Construction Mobilization

Upon notice to proceed, the contractor and construction management would assemble their on-site management and construction staff at a temporary office including phone, fax, and data lines, to be located in, or near the construction area. The contractor and construction subcontractors would have separate field offices.

A laydown yard would be prepared for storage of materials. A material manager would inventory received material. Yard staff would load the transport trailers that would deliver the material to the field. Additional yards may be established to serve as material marshaling facilities, crew assembly locations, and equipment yards. These yards would all be within the project footprint and would not require any additional ground disturbance. Over a 12-month construction period, the gen-tie workforce will average 30 employees and no more than 65 employees at any one point.

A total of 240 material deliveries are expected during the construction period for the gen-tie line. Material deliveries expected during gen-tie line construction are detailed in Table 2-7.

Table 2-7. Material Deliveries During Construction – Gen-Tie Line

Materials Delivered	Truck Deliveries	Truck Type	Duration	Construction Phase
Transmission structures	54	Semi-truck w/flatbed	1.5 months	Mobilization through foundation installation
Conductor, ground wire, optical ground wire	27	Semi-truck w/flatbed	1 month	Mobilization through foundation installation
Concrete	147	Concrete truck	2 months	Foundation installation
Miscellaneous material	10	Semi-truck w/flatbed	1 month	Mobilization through foundation installation

All material deliveries are expected to arrive via I-10 from the west. The equipment expected to be used on-site during gen-tie line construction is detailed in Table 2-8.

Table 2-8. Construction Equipment and Vehicles – Gen-Tie Line

Construction Phase(s)	Equipment	Pieces	Average Hours Used per Day	Purpose
Start of foundation installation through wire installation	5,000-gallon water truck	1	8	General servicing & dust mitigation
Start of foundation installation through wire installation	Service truck	1	8	General servicing & dust mitigation
Start of foundation installation through wire installation	Mechanic truck	2	8	General servicing & dust mitigation
Stake structures and foundation installation	Enclosed material trailers	4	Parked	Material handling & material yard / hauling equipment
Stake structures and foundation installation	40-ton crane	1	4	Material handling & material yard / hauling equipment
Stake structures and foundation installation	4x4 forklifts	2	4	Material handling & material yard / hauling equipment
Stake structures, foundation installation, ROW restoration & cleanup	1-ton crew cab	1	8	Access road / clearing crew / ROW restoration

Table 2-8. Construction Equipment and Vehicles – Gen-Tie Line

Construction Phase(s)	Equipment	Pieces	Average Hours Used per Day	Purpose
Stake structures, foundation installation, ROW restoration & cleanup	¾-ton pickup	2	8	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	Bulldozers	2	8	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	Backhoes	1	4	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	Dump truck	1	4	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	Steel wheel/smooth drum roller	1	6	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	Road grader	1	2	Access road / clearing crew / ROW restoration
Stake structures, foundation installation, ROW restoration & cleanup	10,000-gallon water truck	1	4	Access road / clearing crew / ROW restoration
Foundation installation	1-ton crew cab	4	8	Foundation crews (2)
Foundation installation	¾-ton pickup	3	8	Foundation crews (2)
Foundation installation	Drilling rig	2	8	Foundation crews (2)
Foundation installation	40-ton crane	2	4	Foundation crews (2)
Foundation installation	Forklifts	2	4	Foundation crews (2)
Foundation installation	Towed trailers	2	Parked	Foundation crews (2)
Foundation installation	Water pump	2	1	Foundation crews (2)
Foundation installation	Bulldozers	2	2	Foundation crews (2)
Foundation installation	Front-end wheel loaders	2	6	Foundation crews (2)
Foundation installation	Road tractor w/lowboy trailer	2	2	Foundation crews (2)
Foundation installation	Air compressors	2	2	Foundation crews (2)
Foundation installation	Rock hammer	1	As required	Foundation crews (2)
Foundation installation	Mobile mixer	1	As required	Foundation crews (2)
Foundation installation	Water truck or transportable holding tank w/sufficient capacity to retrieve polymer slurry	1	As required	Foundation crews (2)
Foundation installation	1-ton crew cab	2	8	Setting crew
Foundation installation	¾-ton pickup	1	8	Setting crew
Foundation installation	100-ton crane	1	8	Setting crew
Foundation installation	Forklift	1	6	Setting crew

Gen-Tie Access Road Clearing and Construction

Access roads would be developed to access Alternative B. This would include the permanent roads to the new transmission structure locations and temporary roads for construction. Larger temporary areas around the structures would be necessary during construction to accommodate pole assembly and erection. Clearing and grading would also be needed for wire setup sites. Puller and tensioner sites would require a large, fairly level area to safely accommodate all the equipment required on a wire stringing operation. It is assumed that each location of a tensioner and conductor would occupy an area 100 feet in width by 450 feet in length. These sites may be

constructed in conjunction with the access roads and would be determined once the wire pulls have been planned. A cleared area directly behind each outside angle of dead-end towers is required to maintain the 3:1 wire-stringing ratio. During the construction period, no disturbance beyond the clearing limits would be allowed.

Preventative measures to minimize wind transport of soil would be implemented. Dust abatement would be accomplished through watering.

Foundation Installation

Three types of foundations may be used for construction of Alternative B: drilled shaft anchor-bolted foundations, drilled shaft embedded foundations, and vibrated steel casings. The first two methods involve constructing the foundations on-site. The third method involves using pre-fabricated components for the foundation.

Grounding

The grounding crew would follow behind the erection crew, installing the grounding. Grounding consists of connecting the electrically conductive elements of a transmission line to the earth. This is done in order to create a path of least resistance in case there is an electrical failure or lightning strike along the line. Typical grounding consists of installation of a ground rod and connecting the rod to the structure with a wire.

Framing Structures

Structures would be hauled, assembled, and erected at the designated site in the conventional manner. Structures would be picked up from the material storage yard, hauled to various structure sites or marshaling yards and unloaded. Structures would be assembled in sections on cribbing that would provide for the proper alignment of the steel members. Steel sections would be laid out with hydraulic cranes. The pole base and top sections would be assembled at each structure site.

Setting Structure/Erection

A crane would be used for pole erection to set the pole base sections on the anchor bolts or into the drilled shaft hole, depending on the type of foundation. The crew would have an air compressor and air guns for tightening anchor bolt nuts while maintaining level and plumb.

Guard Structures

Wood pole guard structures would be erected at each road or utility line crossing or at other areas along the ROW where guard structure crossing structures are required. Guard poles would be required at all energized crossings and roads where there is a hazard to people and traffic. Guard pole structures are temporary and would be removed after the conductors have been dead-ended and clipped.

Wire Stringing

Conventional wire stringing is assumed for Alternative B. Wire stringing includes all activities associated with the installation of conductors onto transmission structures and includes the installation of primary conductor, ground wire, and hardware assemblies. A standard wire stringing

plan includes a sequenced program of events starting with determination of the length of wire pulls and wire pull equipment set-up positions. Wire pulling is one of the stringing activities and requires special equipment to pull the wire through wire sheaves and rollers temporarily installed on the transmission structures. Wire splicing is needed to splice together conductor wire (or ground wire) to form longer segments of conductor between pulling locations.

Final inspection and testing would need to be coordinated with functional checkout and commissioning of the substation equipment at each end of the line.

The ROW would be cleared of all construction materials and equipment and the end of construction.

Construction Schedule

Construction of Alternative B would begin in 2013 (depending on Record of Decision (ROD) issuance) and would last for an estimated 12 months. Gen-tie construction would occur concurrently with Desert Sunlight, if feasible.

2.10.4 Operations and Maintenance

DHSP operations and maintenance personnel would perform periodic maintenance of the gen-tie line, and no additional personnel would be required. Operation and maintenance of the proposed project gen-tie line would involve periodic inspection via helicopter or truck. The transmission lines would be maintained on an as-needed basis and would include maintenance of access roads and erosion/drainage control structures.

All telecommunications equipment would be operated and maintained by site personnel. Preventative maintenance of telecommunications infrastructure would typically be scheduled every year to ensure system reliability and performance.

2.10.5 Decommissioning of Facility

Conditions are likely to change over the course of a project lifespan of 30 years or more, and a final Decommissioning Plan would be developed in the future prior to facility closure based on conditions as they occur at that time. The reclamation measures provided in the Decommissioning Plan would be developed with the goal to return the land to its previous, pre-ROW, condition and to ensure protection of the environment and public health and safety and to comply with applicable laws, ordinances, regulations, and standards.

In general, the project's Decommissioning Plan would address:

- BLM's planned future use of the land and the methods of and need to return the land it its pre-ROW condition. This is with the understanding that the gen-tie may be co-located on towers with another ROW holder that may still have an on-going use for the towers and road.
- Proposed decommissioning and reclamation measures for the project and associated facilities;
- Activities necessary for site restoration/re-vegetation;
- Removal of equipment and facilities through reuse or recycling if available, or on-site reuse if there is a need of this use by another entity;
- Procedures for reuse, recycling, or disposal of facility components; collection and disposal of hazardous wastes; and use or disposal of unused chemicals;

- Costs associated with the planned decommissioning activities; and
- Conformance with applicable laws, ordinances, regulations, and standards.

The Decommissioning Plan would be developed in coordination with the BLM and submitted to the BLM for review and approval prior to final closure of the facility.

2.11 ALTERNATIVE C: SEPARATE TRANSMISSION TOWERS WITHIN SAME ROW

Portions of the Alternative C gen-tie line would not be located in a designated utility corridor. Construction of those portions of Alternative C on BLM-administered land would require a Plan Amendment to the CDCA Plan. Figure 2-1 (Project Overview) shows the portions of the gen-tie alternatives, including Alternative C, which would be located on BLM-administered land and outside of a BLM designated utility corridor. A total of 5.4 miles of Alternative C would be located on BLM land outside a designated utility corridor, and an additional 6 miles would require 60 feet of additional ROW width that would be outside of a designated utility corridor.

2.11.1 Overview

As shown in Figure 2-14 in Appendix A, unlike Alternative B, which involves the co-location on the approved transmission towers for the Desert Sunlight Project, Alternative C would parallel the approved DSSF gen-tie line, and would be located on separate towers within a wider ROW. The same number of towers in a nearly identical alignment to that of the DSSF towers would be constructed. The Alternative C alignment would be the same as that described for Alternative B in Section 2.10 but would be located an estimated 100 feet west of the DSSF towers, in a wider ROW. The Alternative C ROW would extend west of the approved DSSF gen-tie ROW, 60 feet into the adjacent Chuckwalla DWMA to accommodate wind sway of overhanging conductors over the DWMA boundary. No planned temporary or permanent ground disturbance would occur within the DWMA; ground disturbance in the DWMA would occur only during emergency maintenance. The access route to the towers would be on unpaved roads from Kaiser Road.

A laydown yard would be prepared for storage of materials. A material manager would inventory received material. Yard staff would load the transport trailers that would deliver the material to the field. Additional yards may be established to serve as material marshaling facilities, crew assembly locations, and equipment yards. These yards would all be within the project footprint and would not require any additional ground disturbance.

Construction of Alternative C would occur on the same schedule as Alternative B.

2.11.2 Construction, Operation, and Decommissioning Activities

Construction, operation, and maintenance of Alternative C would be identical to that described for Alternative B, except for some additional ground disturbance required for the new tower locations, pulling stations, and dead-end poles. As with Alternative B, pulling stations and dead-end poles will require an additional 450-foot fan-shaped area for construction equipment. Temporary ground disturbance for the alternative would be 256 acres and permanent ground disturbance would be 92 acres.

2.12 ALTERNATIVE D: CROSS-VALLEY ALIGNMENT OF GEN-TIE LINE

Portions of the Alternative D gen-tie line would not be located in a designated utility corridor. Construction of those portions of Alternative D on BLM-administered land would require a Plan Amendment to the CDCA Plan. Figure 2-1 (Project Overview) shows the portions of the gen-tie alternatives, including Alternative D, which would be located on BLM-administered land and outside of a BLM designated utility corridor. A total of 3.9 miles of Alternative D would be located on BLM land outside a designated utility corridor.

2.12.1 Overview

As shown on Figure 2-15 in Appendix A, Alternative D would parallel the approved Desert Sunlight gen-tie line for 2,400 feet along the east side of Kaiser Road until intersecting with the existing SCE transmission line ROW. Alternative D would turn southeast and run parallel to the existing transmission ROW for 7.2 miles, then turn south for 0.6 miles, continuing due west for 0.5 miles until it turns south across I-10 and continues 1,000 feet (not along any existing feature) to Red Bluff Substation. The center of the new line would be located 140 to 150 feet from the centerline of the existing SCE line, but would not be within the SCE ROW.

Along Kaiser Road, the center of the 160-foot transmission line ROW would be located an estimated 120 to 130 feet east from the center of the paved roadbed, on BLM land. The new transmission line would cross over or under the existing SCE line, subject to agreement with SCE, and then turn southeast along the south side of the corridor. The land ownership of the 160-foot-wide transmission easement would be as follows:

- From mile 0.0 to mile 0.5 on MWD land;
- From mile 0.5 to mile 2.3 on BLM land;
- From mile 2.3 to mile 5.0 on private land;
- From mile 5.0 to mile 5.6 on BLM land;
- From mile 5.6 to mile 6.6 on private land; and
- From mile 6.6 to mile 10.1 on BLM land into the Substation.

Of the 10.1-mile ROW, a total of 6 miles would be on BLM land and 4.1 miles would be on private land. For the portions on private land, 20 separate parcels would be crossed. The Applicant has not acquired land rights for all of these parcels, and would pursue easements through negotiations with the owners. Riverside County would issue a Public Use Permit for the MWD land and private land crossings and an Encroachment Permit for access into the County road ROW. Both MWD and the County would rely on this EIS to satisfy their CEQA obligations.

The 160-foot-wide corridor and additional fan-shaped areas at corners used for wire stringing for Alternative D would encompass 226 acres. The total length of Alternative D is 10.1 miles. The elevation of Alternative D varies from 592 to 765 feet above mean sea level. An estimated 59 transmission structures would be required for this alternative, including 51 tangents and 8 dead-ends. Four splicing locations and 16 guard structures would be used temporarily during construction. Permanent access roads would be constructed to provide access for maintenance of the gen-tie, as needed. Table 2-9 below provides a list of major gen-tie components, along with the acreage required for each component.

Table 2-9. Alternative D – Project Facilities, Components, and Percent of Gen-Tie Corridor

Project Facility or Component	Dimensions	Percent of Gen-Tie Corridor
Gen-tie line Corridor	Width: 160 feet and additional fan-shaped areas at corners Length: 10.5 miles Area: 226 acres	100
Permanent disturbance	86 acres	38.1
Total transmission structure footprint	2,345 square feet (0.05 acre)	< 0.1
Individual transmission structure footprint	Tangent Structure: 28.3 square feet Dead-end: 113.1 square feet	< 0.1
Permanent access roads	Width: 14 feet Length: 9.9 miles Area: 16.8 acres	7.4
Temporary access roads	Width: 14 feet Length: 10.8 mile Acres: 18.2 acres	8.1

2.12.2 Construction, Operation, and Decommissioning Activities

Construction, operation, and maintenance of Alternative D would be identical to that described for Alternative B, except it would require slightly less temporary and permanent ground disturbance. As with Alternative B, pulling stations and dead-end poles will require an additional 450-foot fan-shaped area for construction equipment. However, because it would require new access routes for the transmission line, Alternative D would require about 3,700 cubic yards of aggregate. The gen-tie staging area would be located along the ROW and would require another 2,000 cubic yards of aggregate.

2.13 ALTERNATIVE E: NEW CROSS-VALLEY ALIGNMENT

Portions of the Alternative E gen-tie line would not be located in a designated utility corridor. Construction of those portions of Alternative E on BLM-administered land would require a Plan Amendment to the CDCA Plan. Figure 2-1 (Project Overview) shows the portions of the gen-tie alternatives, including Alternative E, which would be located on BLM-administered land and outside of a BLM designated utility corridor. A total of 5.4 miles of Alternative E would be located on BLM land outside a designated utility corridor.

2.13.1 Overview

As shown on Figure 2-16 in Appendix A, Alternative E would exit the south end of the solar facility site at a point 0.8 miles from its southeast corner at a substation location shown on Figure 2-17 in Appendix A. It would travel southeast for 1.8 miles across properties owned in fee by MWD then turn east for 0.5 miles across MWD and BLM land, then run south for 0.25 miles until just before Highway 177. Alternative E would then turn southeast for 0.3 miles crossing over Highway 177 then travel due east for 1.75 miles over the MWD property and BLM land. It would then turn southeast for 1.3 miles, then due south for 3.8 miles. Alternative E would then turn west for 1.75 miles crossing the I-10 to reach the Red Bluff Substation.

The 160-foot transmission line ROW is an overland route that does not follow any existing road or improved utility ROW features. The new transmission line would have to cross over or under the existing SCE line in one location, subject to agreement with SCE. A crossing of Riverside County

ROW (Rice Road/CR 177 is also required. The land ownership of the 160-foot-wide transmission easement would be as follows:

- From mile 0 to mile 2.2 on MWD land;
- From mile 2.2 to mile 2.4 on BLM land;
- From mile 2.4 to mile 4.2 on MWD land and would require crossing Rice Road;
- From mile 4.2 to mile 6.2 on BLM land;
- From mile 6.2 to mile 6.45 on MWD land; and
- From mile 6.45 to mile 11.5 on BLM land into the Substation.

Of the 11.5-mile ROW, a total of 7.2 miles would be on BLM land and 4.3 miles would be on private land under the administration of MWD. A total of 7 MWD parcels would be crossed. Applicant has not acquired land rights for all of these parcels. Riverside County would issue a Public Use Permit for the MWD land and an encroachment permit for crossing the County road ROW. Both MWD and the County would rely on this EIS to satisfy their CEQA obligations.

The 160-foot-wide corridor and additional fan-shaped areas at corners used for wire stringing for Alternative E would encompass 244 acres. The total length of Alternative E is 11.5 miles. The elevation of Alternative E varies from 484 to 770 feet above mean sea level. An estimated 62 transmission structures would be required for this alternative, including 51 tangents and 11 dead-ends. Five splicing locations and 20 guard structures would be used during construction. Permanent access roads would be constructed in order to provide access for maintenance of the gen-tie, as needed. Table 2-10 provides a list of major gen-tie components, along with the acreage required for each component.

Table 2-10. Alternative E – Description of Components

Project Facility or Component	Dimensions	Percent of Gen-Tie Corridor
gen-tie line Corridor	Width: 160 feet plus additional fan-shaped areas at corners Length: 11.0 miles ROW Area: up to 244 acres	100
Permanent disturbance (within corridor)	85	35
Total transmission structure footprint	2,687 square feet (0.06 acres)	< 0.1
Individual transmission structure footprint	Tangent structure: 28.3 square feet; dead-end: 113.1 square feet	< 0.1
Permanent access roads	Width: 14 feet Length: 11 miles 18.7 acres	4.8
Temporary access roads	N/A	0

The Applicant proposes to use steel monopoles for the gen-tie line. Poles are expected to be 135 feet tall. Typical spacing between structures would be 900 to 1,100 feet. Self-weathering steel would be used for the monopoles, which are intended to blend with the surrounding mountains.

2.13.2 Construction, Operation, and Maintenance Activities

Construction, operation, and maintenance of Alternative E would be identical to that described for Alternative B, except for it would require slightly less temporary and permanent ground disturbance. As with Alternative B, pulling stations and dead-end poles will require an additional

450-foot fan-shaped area for construction equipment. However, because it would require new access routes for the transmission line, Alternative E would require about 3,700 cubic yards of aggregate. Another 2,000 cubic yards of aggregate would be required for the gen-tie staging area, which would be located along the ROW.

2.14 SUMMARY COMPARISON OF EFFECTS BY ALTERNATIVE

Table 2-11 presents a comparison among the solar facility action alternatives. Table 2-12 presents a comparison among the gen-tie action alternatives. Table 2-13 presents a comparison of solar facility and gen-tie action alternative combinations, building upon what is presented in Tables 2-11 and 2-12. For simplicity, numerical codes and shades of gray are used to indicate the severity and magnitude of direct, indirect, and cumulative environmental effects. For NEPA, a lower number and a lighter shade represents a less severe and a smaller magnitude of adverse environmental effects. For CEQA, a lower number and a lighter shade represents an environmentally superior action alternative combination. The information regarding CEQA significance and environmental superiority is provided for future use by CEQA Lead and Responsible Agencies and is not required under NEPA.

The combination of action alternatives that would have the fewest and least severe direct, indirect, and cumulative environmental effects is solar facility Alternative 6 (Reduced Footprint) plus gen-tie Alternative B (Shared Gen-Tie), or Alternative 6-B.

Alternative 6-B would have unavoidable adverse effects on Air Resources (exceed PM10, VOC, CO, NOx thresholds during construction), Vegetation Resources (direct effects on special status plants), Wildlife Resources (loss and fragmentation of habitat for special status species and displacement of wildlife), Cultural Resources (effects on NRHP-eligible resources and potentially buried resources), Noise and Vibration (construction and decommissioning traffic noise), Recreation (reduce Wilderness experience), Visual Resources (land scarring, contrast, degradation of scenic vistas), Water Resources (contribute to overdraft conditions if adequate mitigation is infeasible).

A complete No Action alternative is a combination of Alternative 1: No Action Alternative (No Plan Amendment) and Alternative A: No Gen-Tie, or Alternative 1-A. Alternative 1-A would not preclude future solar development on the project location; therefore it is possible that another project proponent would submit a ROW application to the BLM for use of the site for solar generation or other land uses, such as mining, livestock grazing, recreation, and energy.

There are two complete No Project with Plan Amendment alternatives under NEPA: Alternative 2-A, which is a combination of Alternative 2: No Project Alternative (with Plan Amendment to Find the Site Suitable for Solar Energy Development) and Alternative A: No Gen-Tie; or, Alternative 3-A, which is a combination of Alternative 3: No Project Alternative (with Plan Amendment to Find the Site Unsuitable for Solar Energy Development) and Alternative A: No Gen-Tie. Under Alternative 2-A, the proposed solar facility would not be approved, and a CDCA Plan Amendment would find the site suitable for large-scale solar energy development. With such an amendment, a similar solar project could be proposed on the project site in the future. Project impacts associated with such a future project would be analyzed at the time such a project is proposed. The project site would remain available for other types of uses allowable on BLM land, including mining, recreation, utilities, and other energy development.

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Air Resources	■ A larger area would create greater air resource impacts from increased ground disturbance, construction requirements, and truck trips. These impacts would not be substantially larger as the size difference is slight and many workforce and construction requirements would not change. ■ Cumulative adverse impacts would be temporary and unavoidable during construction ■ Unavoidable adverse effects would be similar for all alternatives CEQA: Roughly Environmentally Equivalent*	■ The smaller area of this alternative would slightly reduce potential air resource impacts, but many construction requirements and practices that generate these impacts would be identical to Alternative 4. The WHMA itself does not have any characteristics that make its exclusion further reduce air resource impacts. ■ Cumulative impacts would be temporary and unavoidable during construction ■ Unavoidable adverse effects would be similar across all alternatives CEQA: Roughly Environmentally Equivalent	■ The smaller area of this alternative would slightly reduce potential air resource impacts, but many construction requirements and practices that generate these impacts would be identical to Alternative 4. The southern parcel itself does not have any characteristics that make its exclusion further reduce air impacts. ■ Cumulative impacts would be temporary and unavoidable during construction ■ Unavoidable adverse effects would be similar across all alternatives CEQA: Roughly Environmentally Equivalent	■ The smaller area of this alternative would slightly reduce potential air resource impacts, but many construction requirements and practices that generate these impacts would be identical to Alternative 4. The southern parcel and high-profile panels do not have any characteristics that further reduce air impacts. ■ Cumulative impacts would be temporary and unavoidable during construction ■ Unavoidable adverse effects would be similar across all alternatives CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Biological Resources – Vegetation	■ A larger area would have a greater impact on vegetation and habitat on site. Off-site impacts would be roughly equivalent to other alternatives. The site would impact 259 acres of state jurisdictional areas, 113 acres of state-jurisdictional streambeds, and 180 acres of Blue Palo Verde Ironwood Woodland (a special status plant community). ■ Would remove special-status plants including Utah vine milk-vetch, and desert unicorn-plant. ■ Cumulative effects: would contribute 661 acres of impact to Sonoran-Creosote Bush Scrub and 547 acres of impact to Desert Dry Wash Woodland ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior (same as Alt 5)	■ A smaller area would slightly reduce impacts to vegetation. Impacts to state jurisdictional areas would be 254 acres, and impacts to state-jurisdictional streambeds would be 110 acres. These reductions are not large enough to substantially reduce the impacts of Alternative 4. ■ Would remove special-status plants including Utah vine milk-vetch, and desert unicorn-plant. ■ Cumulative effects: would contribute 624 acres of impact to Sonoran-Creosote Bush Scrub and 537 acres of impact to Desert Dry Wash Woodland ■ Unavoidable adverse effects would be nearly identical to Alternative 4 CEQA: Environmentally Inferior (same as Alt 4)	■ Alternative 6 would reduce impacts to on site habitat and vegetation. Impacts to Blue Palo Verde–Ironwood Woodland, a special status plant community, would be substantially reduced to 98 acres (a 46 percent reduction in impacts). Impacts to state-jurisdictional streambeds would be reduced to 79 acres, and total impacts to state jurisdictional areas would be reduced to 164 acres. Alternative 6 would not require use of two separate parcels of land and would not require an underground electrical connection across the wash. ■ Cumulative effects: would contribute 624 acres of impact to Sonoran-Creosote Bush Scrub and 420 acres of impact to Desert Dry Wash Woodland ■ Unavoidable adverse effects would exist, but would be reduced for special status species and state-jurisdictional areas CEQA: Environmentally Superior (same as Alt 7)	■ Alternative 7 would reduce impacts to on site habitat and vegetation. Impacts to Blue Palo Verde–Ironwood Woodland, a special status plant community, would be substantially reduced to 98 acres (a 46 percent reduction in impacts). Impacts to state-jurisdictional streambeds would be reduced to 79 acres, and total impacts to state jurisdictional areas would be reduced to 164 acres. Alternative 6 would not require use of two separate parcels of land and would not require an underground electrical connection across the wash. ■ ■ Cumulative effects: would contribute 624 acres of impact to Sonoran-Creosote Bush Scrub and 420 acres of impact to Desert Dry Wash Woodland ■ Unavoidable adverse effects would exist, but would be reduced for special status species and state-jurisdictional areas ■ CEQA: Environmentally Superior (same as Alt 6)

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Biological Resources – Wildlife	■ A larger area would have a greater impact on wildlife habitat on site and wildlife movement. Off-site impacts would be roughly equivalent to other alternatives. The site would impact 46 acres in the Palen-Ford Wildlife Habitat Management Area ■ Cumulative effects: contribute 1,208 acres impact desert tortoise habitat. ■ Cumulative effects: loss of habitat would be greater due to larger size of project. ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior (same as Alt 5)	■ A smaller area would slightly reduce impacts to wildlife habitat. Project would avoid impacts to the Palen-Ford Wildlife Habitat Management Area. These reductions are not large enough to substantially change the impacts of Alternative 4. ■ Cumulative effects: contribute 1,161 acres impact to desert tortoise habitat. ■ Cumulative effects: loss of habitat would be similar to impacts of Alternative 4. ■ Unavoidable adverse effects would be nearly identical to Alternative 4 CEQA: Environmentally Inferior (same as Alt 4)	■ A smaller area would slightly reduce impacts to wildlife habitat. Project would avoid impacts to Blue Palo Verde-Ironwood Woodland in the southern parcel. This habitat which provides habitat elements not available in the surrounding creosote scrub. These reductions would reduce the impacts of Alternative 4. ■ Cumulative effects: contribute 1,044 acres impact to desert tortoise habitat. ■ Cumulative effects: loss of habitat would be similar to impacts of Alternative 4. ■ Unavoidable adverse effects would be nearly identical to Alternative 4 CEQA: Environmentally Superior (Same as Alt 7)	■ A smaller area would slightly reduce impacts to wildlife habitat. Project would avoid impacts to Blue Palo Verde-Ironwood Woodland in the southern parcel. This habitat which provides habitat elements not available in the surrounding creosote scrub. These reductions would reduce the impacts of Alternative 4. ■ Cumulative effects: contribute 1,044 acres impact to desert tortoise habitat. ■ Cumulative effects: loss of habitat would be similar to impacts of Alternative 4. ■ Unavoidable adverse effects would be nearly identical to Alternative 4 ■ CEQA: Environmentally Superior (Same as Alt 7)
Climate Change	■ This Alternative would generate greater greenhouse gas emissions due to increased demands for construction, transportation, and maintenance of a slightly larger area. These impacts would not be substantially larger, however, as the size difference is slight and many workforce and construction requirements would not change. CEQA: Roughly Environmentally Equivalent	■ A slightly smaller area would generate slightly fewer greenhouse gas emissions. Many construction and transportation practices would be consistent with Alternative 4 despite the reduction in size, and impacts would be nearly identical. The WHMA itself does not have any characteristics that make its exclusion further reduce climate change impacts. CEQA: Roughly Environmentally Equivalent	■ A slightly smaller area would generate slightly fewer greenhouse gas emissions. Many construction and transportation practices would be consistent with Alternative 4 despite the reduction in size, and impacts would be nearly identical. The southern parcel itself does not have any characteristics that make its exclusion further reduce climate change impacts. CEQA: Roughly Environmentally Equivalent	■ A slightly smaller area would generate slightly fewer greenhouse gas emissions. Many construction and transportation practices would be consistent with Alternative 4 despite the reduction in size, and impacts would be nearly identical. The southern parcel itself does not have any characteristics that make its exclusion further reduce climate change impacts. CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Cultural Resources	■ Would adversely affect potentially one NRHP-eligible historic district, and potentially affect unknown buried resources. ■ Cumulative effects: contribute to unavoidable adverse effects in I-10 region and Southern California Desert Region ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	Same as Alt 4 as the disturbed area would be only marginally smaller. CEQA: Roughly Environmentally Equivalent	Same as Alt 4 but a reduced footprint would likely reduce the total number of cultural resources impacted. CEQA: Roughly Environmentally Equivalent	Same as Alt 4 but a reduced footprint would likely reduce the total number of cultural resources impacted. CEQA: Roughly Environmentally Equivalent
Paleontological Resources	■ The geologic units present at the site have a high potential to contain vertebrate fossils and other paleontological resources. A larger area would have a greater potential for adverse direct effects on the resources. ■ The potential for indirect effects to paleontological resources is also high. ■ Cumulative effects would be adverse, but could result in an overall benefit to science CEQA: Roughly Environmentally Inferior	Same as Alt 4 as the disturbed area would be only marginally smaller. CEQA: Roughly Environmentally Inferior	Same as Alt 4 but a reduced footprint would likely reduce the total number of paleontological resources impacted. CEQA: Roughly Environmentally Equivalent	Same as Alt 4 but a reduced footprint would likely reduce the total number of paleontological resources impacted. CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Fire and Fuels Management	■ Alternative 4 would have a slightly larger impact on fire and fuels management due to the larger area of impact and the fire risks of additional equipment and workforce. Quantifying this increased risk precisely is not possible, but it would not be significantly greater. ■ Indirect effects: non-native plant invasion increases susceptibility to wildfire ■ Cumulative effects: Project would contribute to risk of increased fire frequency CEQA: Roughly Environmentally Equivalent	■ Alternative 5 would have a slightly reduced impact on fire and fuels management due to the smaller area of impact and lower equipment and workforce requirements. Many construction practices would be identical to Alternative 4. The WHMA itself does not have any characteristics that make its exclusion further reduce fire risk. ■ Indirect effects: non-native plant invasion increases susceptibility to wildfire ■ Cumulative effects would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Alternative 6 would have a slightly reduced impact on fire and fuels management due to the smaller area of impact lower equipment and workforce requirements. Many construction practices would be identical to Alternative 4. The southern parcel does not have any characteristics that make its exclusion further reduce fire risk. ■ Indirect effects: non-native plant invasion increases susceptibility to wildfire ■ Cumulative effects would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Alternative 7 would have a slightly reduced impact on fire and fuels management due to the smaller area of impact lower equipment and workforce requirements. Many construction practices would be identical to Alternative 4. The southern parcel does not have any characteristics that make its exclusion further reduce fire risk. ■ Indirect effects: non-native plant invasion increases susceptibility to wildfire ■ Cumulative effects would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent
Soils	■ Alternative 4 would have a slightly larger impact on soils due to the larger area of impact and the additional equipment and workforce. Geological hazards and risks would not increase due to increased size. ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Roughly Environmentally Equivalent	■ Alternative 5 would have a slightly reduced impact on soils due to the smaller area of impact and lower equipment and workforce requirements. Many construction practices would be identical to Alternative 4 l. The reduced size would not reduce risks and potential impacts of geologic hazards. The WHMA itself does not have any characteristics that make its exclusion further reduce impacts to soils and geology. ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Roughly Environmentally Equivalent	■ Alternative 6 would have a slightly reduced impact on fire and fuels management due to the smaller area of impact lower equipment and workforce. Many construction practices would be identical to Alternative 4. The reduced size would not reduce risks and potential impacts of geologic hazards. The southern parcel itself does not have any characteristics that make its exclusion further reduce impacts to soils and geology. ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Roughly Environmentally Equivalent	■ Alternative 7 would have a slightly reduced impact on fire and fuels management due to the smaller area of impact lower equipment and workforce. Many construction practices would be identical to Alternative 4. The reduced size would not reduce risks and potential impacts of geologic hazards. The southern parcel itself does not have any characteristics that make its exclusion further reduce impacts to soils and geology. ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Minerals	■ Because of its size, the demands on necessary mineral resources for construction would be slightly greater. The demand is negligible relative to the local supply. The configuration of this alternative would not block or restrict access to other mineral resources in the area. ■ There would be no adverse cumulative effects. CEQA: Roughly Environmentally Equivalent	■ The demands of this alternative on mineral resources would not be significantly different than those of Alternative 4. The WHMA does not contain any additional mineral resources, and its exclusion would not further improve access to any mineral resources. ■ There would be no adverse cumulative effects. CEQA: Roughly Environmentally Equivalent	■ The demands of this alternative on mineral resources would not be significantly different than those of Alternative 4. The southern parcel does not contain any additional mineral resources, and its exclusion would not further improve access to any mineral resources. ■ There would be no adverse cumulative effects. CEQA: Roughly Environmentally Equivalent	■ The demands of this alternative on mineral resources would not be significantly different than those of Alternative 4. The southern parcel does not contain any additional mineral resources, and its exclusion would not further improve access to any mineral resources. ■ There would be no adverse cumulative effects. CEQA: Roughly Environmentally Equivalent
Lands and Realty	■ Would impact the Palen-Ford WHMA and preclude it from uses besides solar electricity generation. This portion of the WHMA has been isolated by the neighboring DSSF, reducing its importance as a protected space. Would impacts existing encumbrances. ■ Cumulative effects: would contribute to the conversion of land along the I-10 corridor, due to the scale of land use conversion cumulative adverse effects would be substantial ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior (same as Alt 5)	■ This reduced area alternative would not directly impact the Palen-Ford WHMA. Alternative would impact existing encumbrances. ■ Cumulative effects: project would contribute to the conversion of land along the I-10 corridor, due to the scale of land use conversion cumulative adverse effects would be substantial ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior (Same as Alt 4)	■ Would impact the Palen-Ford WHMA and preclude it from all uses besides solar electricity generation same as Alt 4. Would not affect existing encumbrances. ■ Cumulative effects: project would contribute to the conversion of land along the I-10 corridor, due to the scale of land use conversion cumulative adverse effects would be substantial ■ Unavoidable adverse effects would occur CEQA: Environmentally Superior (same as Alt 7)	■ Would impact the Palen-Ford WHMA and preclude it from all uses besides solar electricity generation same as Alt 4. Would not affect existing encumbrances. ■ Cumulative effects: project would contribute to the conversion of land along the I-10 corridor, due to the scale of land use conversion cumulative adverse effects would be substantial ■ Unavoidable adverse effects would occur CEQA: Environmentally Superior (same as Alt 6)

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Noise and Vibration	■ Due to the distance between the solar facility and nearest sensitive receptors on-site noise impacts would not occur ■ Traffic would result in little noise effect in Desert Center due to the noise generated by traffic on I-10. Would result in a noticeable increase in traffic noise levels along Kaiser Road at Lake Tamarisk. Increase would be conditionally acceptable. ■ Construction would not cause perceptible ground vibrations. ■ Cumulative effects: project would not contribute to on-site cumulative noise effects. Traffic noise would contribute to a cumulative increase in noise along Kaiser Road at Lake Tamarisk. Increase would remain within a conditionally acceptable range. ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4 for both on-site noise and traffic. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4. ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4 for both on-site noise and traffic. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4. ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4 for both on-site noise and traffic. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4. ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Public Health and Safety	■ Larger land area would be disturbed but practices and risks that could generate public health and safety impacts are not proportional to area of disturbance. Impacts would be the same across all alternatives. ■ Cumulative effects: Contribute to risk of multiple emergencies occurring at the same time. Response plans and fire management plans would reduce effects CEQA: Roughly Environmentally Equivalent	■ Smaller land area would be disturbed but public health and safety impacts would be the same across all alternatives. Exclusion of the WHMA would not reduce these potential impacts. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Smaller land area would be disturbed but public health and safety impacts would be the same across all alternatives. Exclusion of the southern parcel would not reduce these potential impacts. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Smaller land area would be disturbed but public health and safety impacts would be the same across all alternatives. Exclusion of the southern parcel would not reduce these potential impacts. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 CEQA: Roughly Environmentally Equivalent
Recreation	■ Effects to off-site wilderness areas by diminishing the potential for "wilderness experience." Impacts are not related to the size or configuration of solar field alternatives. ■ Would close 5.7 miles of open OHV routes, a relatively minor recreational effect in light of the other available open routes in the area. ■ Cumulative effects: Contribute to the diminishment of wilderness experience and the loss of lands available for recreation. ■ Unavoidable adverse effects would occur. CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4. Impacts are not related to the size or configuration of solar field alternatives. ■ Would close to 5.7 miles of open OHV routes, a relatively minor recreational effect in light of the other available open routes in the area. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4. Impacts are not related to the size or configuration of solar field alternatives. ■ Would close to 4.2 miles of open OHV routes, but facilitates access to northwest routes. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent	■ This reduced area alternative would have substantially the same impacts as Alternative 4. Impacts are not related to the size or configuration of solar field alternatives. ■ Would close to 4.2 miles of open OHV routes, but facilitates access to northwest routes. ■ Cumulative effects: impacts would be substantially the same as for Alternative 4 ■ Unavoidable adverse effects would occur CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Social and Economic	■ Similar construction workforce would be required across all alternatives. Impacts to local economies, housing, and quality of life resulting from a marginal increase in workforce and construction requirements would be impossible to precisely quantify, potentially offset by increased benefits and limited. ■ Cumulative effects: no adverse social or economic effects. CEQA: Roughly Environmentally Equivalent	■ Same as Alternative 4. The exclusion of the WHMA would not specifically affect social and economic impacts. ■ Cumulative effects: no adverse social or economic effects. CEQA: Roughly Environmentally Equivalent	■ Same as Alternative 4. The exclusion of the southern parcel would not specifically affect social and economic impacts. ■ Cumulative effects: no adverse social or economic effects. CEQA: Roughly Environmentally Equivalent	■ Same as Alternative 4. The exclusion of the southern parcel would not specifically affect social and economic impacts. ■ Cumulative effects: no adverse social or economic effects. ■ CEQA: Roughly Environmentally Equivalent
Environmental Justice	■ Alternative 4 would not disproportionately impact minority or low income populations. Boundaries for the solar field alternatives are approximately the same and impacts to surrounding communities would not differ based on marginal changes to size and configuration. ■ Cumulative effects: no adverse environmental justice effects No CEQA significance criteria for Environmental Justice.	■ Despite size differences, boundaries for the solar field alternatives are approximately the same and populations affected would be the same. ■ Cumulative effects: no adverse environmental justice effects No CEQA significance criteria for Environmental Justice.	■ Despite size differences, boundaries for the solar field alternatives are approximately the same and populations affected would be the same. ■ Cumulative effects: no adverse environmental justice effects No CEQA significance criteria for Environmental Justice.	■ Despite size differences, boundaries for the solar field alternatives are approximately the same and populations affected would be the same. ■ Cumulative effects: no adverse environmental justice effects No CEQA significance criteria for Environmental Justice.
Special Designations	■ Would degrade value of WHMA. ■ Would degrade value of Wilderness. ■ Cumulative effects on Wilderness and ACECs. No CEQA significance criteria for special designations.	■ Would degrade value of Wilderness. ■ Cumulative effects on Wilderness and ACECs. No CEQA significance criteria for special designations.	■ Would degrade value of WHMA. ■ Would degrade value of Wilderness. ■ Cumulative effects on Wilderness and ACECs. No CEQA significance criteria for special designations.	■ Would degrade value of WHMA. ■ Would degrade value of Wilderness. ■ Cumulative effects on Wilderness and ACECs. No CEQA significance criteria for special designations. t

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Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Transportation and Public Access	■ The number of project truck trips would be the same or similar regardless of which solar facility alternative was built. The addition of project construction related traffic would increase the delay at the intersections by less than one second and would not reduce the LOS to below an acceptable level. ■ Cumulative effects: Trips generated by Alternative 4 would combine with trips from other projects to reduce the LOS, but not to a less than acceptable level. Overall, not substantially adverse. CEQA: Roughly Environmentally Equivalent	■ Despite size differences, access routes would be the same and impacts to traffic would not differ. The exclusion of the WHMA would not change traffic impacts. ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Despite size differences, access routes would be the same and impacts to traffic would not differ. The exclusion of the southern portion would not change impacts on traffic. ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Despite size differences, access routes would be the same and impacts to traffic would not differ. The exclusion of the southern portion would not change impacts on traffic. ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Visual Resource	■ Temporary visual effects due to construction equipment, materials, and workforce. ■ Visual effect would be adverse but would not substantially degrade the character and quality of the landscape from Eagles Mountains and Desert Lily ACEC ■ Visual effect would be substantial and adverse from Coxcomb Mountains, Kaiser Road in the proposed project vicinity, ■ Affects dark sky resource at Joshua Tree National Park ■ Cumulative effects: Contribute to the conversion of natural desert landscapes to landscapes that contrast with the natural character ■ Unavoidable adverse effects would occur. CEQA: Environmentally Inferior (same as Alt 5)	■ Construction, operations, and maintenance would be essentially the same as Alternative 4 and the effects would be substantially similar. ■ Cumulative effects: same as Alternative 4 ■ Unavoidable adverse effects would occur. CEQA: Environmentally Inferior (same as Alt 4)	■ Construction, operations, and maintenance would be essentially the same as Alternative 4 and the effects would be substantially similar. ■ For viewers on Kaiser Road, the elimination of the smaller southern development area would render the solar facility noticeably less visible. ■ Cumulative effects: same as Alternative 4 ■ Unavoidable adverse effects would occur. CEQA: Environmentally Superior	■ Construction, operations, and maintenance would be essentially the same as Alternative 4 and the effects would be substantially similar. ■ For viewers on Kaiser Road, the high-profile panels would render the solar facility noticeably more visible. ■ Cumulative effects: same as Alternative 4 ■ Unavoidable adverse effects would occur. CEQA: Environmentally Inferior (worse than Alt 4 and 5)

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Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Water Resources	■ Alternative 4 would require more water for construction (estimated 400 to 500 afy). ■ Mitigation would reduce adverse effects to surface water and drainage patterns, stormwater drainage systems, and flood hazard areas, but could result in adverse effects to desert tortoise, air quality, energy, climate change, noise, and traffic. ■ Would be consistent with beneficial uses and water quality criteria defined in the Basin Plan. ■ Cumulative effects: With mitigation, Alternative 4 would not contribute to cumulative effects associated with groundwater supply and recharge. There would be no cumulative effects associated with surface water, stormwater, flood hazard, or water quality CEQA: Roughly Environmentally Equivalent	■ Alternative 5 would require less water for construction (estimated 385 to 480 afy). ■ Mitigation would reduce adverse effects to surface water and drainage patterns, stormwater drainage systems, and flood hazard areas, but could result in adverse effects to desert tortoise, air quality, energy, climate change, noise, and traffic ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Alternative 6 would require less water for construction (estimated 350 to 435 afy). ■ Mitigation would reduce adverse effects to surface water and drainage patterns, stormwater drainage systems, and flood hazard areas, but could result in adverse effects to desert tortoise, air quality, energy, climate change, noise, and traffic ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent	■ Alternative 6 would require less water for construction (estimated 350 to 435 afy). ■ Mitigation would reduce adverse effects to surface water and drainage patterns, stormwater drainage systems, and flood hazard areas, but could result in adverse effects to desert tortoise, air quality, energy, climate change, noise, and traffic ■ Cumulative effects: Same as Alternative 4 CEQA: Roughly Environmentally Equivalent

Table 2-11. Comparison of Solar Facility Action Alternatives

Environmental Discipline	Alternative 4 (1,208 acres)	Alternative 5 (WHMA excluded – 1,161 acres)	Alternative 6 (southern parcel excluded – 1,044 acres)	Alternative 7 (southern parcels excluded, high-profile panels – 1,044 acres)
Solid and Hazardous Wastes	■ Alternative 4 would require more infrastructure and employ a slightly larger workforce. It could potentially generate more solid and hazardous wastes and require increased disposal efforts. Differences across alternatives are slight and would likely be insubstantial ■ Cumulative effects: Minimal incremental contribution CEQA: Roughly Environmentally Equivalent	■ Alternative 5 would potentially generate fewer solid and hazardous waste impacts. The size difference is not large enough to substantially reduce impacts. Exclusion of the WHMA specifically would not markedly reduce impacts associated with solid and hazardous wastes. ■ Cumulative effects: Minimal incremental contribution CEQA: Roughly Environmentally Equivalent	■ Alternative 6 would potentially generate fewer solid and hazardous waste impacts. The size difference is not large enough to substantially reduce impacts. Exclusion of the southern parcel specifically would not markedly reduce impacts associated with solid and hazardous wastes. ■ Cumulative effects: Minimal incremental contribution CEQA: Roughly Environmentally Equivalent	■ Alternative 7 would potentially generate fewer solid and hazardous waste impacts. The size difference is not large enough to substantially reduce impacts. Exclusion of the southern parcel specifically would not markedly reduce impacts associated with solid and hazardous wastes. ■ Cumulative effects: Minimal incremental contribution CEQA: Roughly Environmentally Equivalent

* For CEQA determinations, Environmentally Equivalent means that there is no difference between impacts associated with each alternative. Roughly Environmentally Equivalent indicates that while there are slight differences in impacts, these differences are not substantial, identifiable, and/or quantifiable.

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Air Quality	■ Effects from construction, ground disturbance, and truck trips ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Impacts would be identical to Alternative B ■ Cumulative impacts would be temporary and unavoidable during construction CEQA: Environmentally Inferior (same as Alts D and E)	■ The slight decrease in area would negligibly change requirements for construction, and impacts would be equivalent to Alternative B ■ Cumulative impacts would be temporary and unavoidable during construction CEQA: Environmentally Inferior (same as Alts C and E)	■ The slight decrease in area would negligibly change requirements for construction, and impacts would be equivalent to Alternative B ■ Cumulative impacts would be temporary and unavoidable during construction CEQA: Environmentally Inferior (same as Alts C and D)
Biological Resources – Vegetation	■ Alternative B would affect 41 acres of creosote (1:1 mitigation) and 51 acres of Blue Palo-Verde Ironwood habitat (3:1 mitigation). Surveys indicate presence of desert unicorn (1 plant found), a special status species. 51 acres of state jurisdictional streambeds would be impacted ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. ■ Unavoidable adverse effects would occur CEQA: Environmentally Superior	■ Alternative C would have identical direct impacts to Alternative B ■ Cumulative effects would include impacts to 47 acres of Sonoran-Creosote Bush Scrub and to 39 acres of desert dry wash woodland. ■ Unavoidable adverse effects would occur CEQA: Environmentally Intermediate	■ Alternative D would affect 20 acres of creosote, 39 acres of Blue Palo-Verde Ironwood habitat, and 27 acres of disused agricultural lands. Surveys indicate presence of Emory's Crucifixion thorn (2 plants found) and Desert Unicorn (1 plant found). 39 acres of state jurisdictional streambeds would be impacted ■ Cumulative effects would include impacts to 36 acres of Sonoran-Creosote Bush Scrub and to 17 acres of desert dry wash woodland. ■ Unavoidable adverse effects would occur CEQA: Environmentally Intermediate	■ Alternative E would affect 5 acres of creosote, 13 acres of creosote on partially stabilized sand fields (5:1 mitigation), 7 acres of active sand dunes (5:1 mitigation), and 60 acres of Blue Palo-Verde Ironwood habitat. Surveys indicate presence of Emory's Crucifixion thorn (1 plant found) and Desert Unicorn (65 plants found). 60 acres of state jurisdictional streambeds would be impacted ■ Cumulative effects would include impacts to 53 acres of Sonoran-Creosote Bush Scrub and to 31 acres of desert dry wash woodland. ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Biological Resources – Wildlife	■ Long-term loss of 96 acres of wildlife habitat. ■ 34 acres of impacts to CHU ■ Would require development of 2 acres of the Chuckwalla DWMA overlap area ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. ■ Unavoidable adverse effects would occur CEQA: Environmentally Superior	■ Alternative C would have identical direct impacts to Alternative B. Alternative C ROW would 60 feet into the DWMA along Kaiser Road. ■ Cumulative effects would contribute a loss of 224 acres of desert tortoise habitat ■ Unavoidable adverse effects would occur CEQA: Environmentally Intermediate	■ Alternative D would have direct impacts similar to Alternative B ■ Impacts of Alternative D to CHU would be reduced to 12 acres ■ Would require development of 2 acres of the Chuckwalla DWMA overlap area ■ Would impact 6 acres of Palen-Ford WHMA ■ Cumulative effects would contribute a loss of 190 acres of desert tortoise habitat along ROW ■ Unavoidable adverse effects would occur CEQA: Environmentally Intermediate	■ Alternative E would have direct impacts similar to Alternative B ■ Construction impacts of Alternative E to wildlife management areas would 2 acres to DWMA, 1.8 acres to overlap area, and 52 acres to Palen Ford WHMA ■ Would impact sand dune habitat and Mojave fringe-toed lizard ■ Cumulative effects would contribute a loss of 222 acres of desert tortoise habitat ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior
Climate Change	■ Would not generate greater greenhouse gas emissions as the size difference is negligible and workforce and construction requirements would be identical. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: minimal contribution CEQA: Environmentally Inferior (same as Alts D and E)	■ Construction and transportation practices would be identical to Alternative B, and the size difference would be negligible. ■ GHG effects associated with construction and decommissioning would be similar to those effects under Alternative B ■ Cumulative effects: minimal contribution CEQA: Environmentally Inferior (same as Alts C and E)	■ Construction and transportation practices would be identical to Alternative B, and the size difference would be negligible. ■ GHG effects associated with construction and decommissioning would be similar to those effects under Alternative B ■ Cumulative effects: minimal contribution CEQA: Environmentally Inferior (same as Alts C and D)

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Cultural Resources	■ May directly affect 1 NRHP-eligible and 18 potentially eligible cultural resources and potential buried archaeological sites. ■ Adverse indirect effects to 3 NRHP-eligible cultural resources: 1 prehistoric district, 1 prehistoric trail, and 1 historic district may occur ■ Cumulative effects: contribute to unavoidable adverse effects in I-10 region and Southern California Desert Region ■ Unavoidable adverse effects would occur CEQA: Environmentally Inferior (same as Alt C)	■ Same as Alternative B. CEQA: Environmentally Inferior (same as Alt B)	■ May directly affect 1 NRHP-eligible and 3 potentially eligible cultural resources and buried sites. ■ Adverse indirect effects to 4 NRHP-eligible cultural resources: 1 prehistoric district, 1 prehistoric trail, 1 historic site and 1 historic district may occur ■ Cumulative effects: contribute to unavoidable adverse effects in I-10 region and Southern California Desert Region ■ Unavoidable adverse effects would occur CEQA: Environmentally Intermediate	■ May directly affect 1 NRHP-eligible and 1 potentially eligible cultural resources and buried sites. ■ Entire alignment not yet surveyed ■ Adverse indirect effects to 3 NRHP-eligible cultural resources: 1 prehistoric district, 1 prehistoric trail, and 1 historic district may occur ■ Cumulative effects: contribute to unavoidable adverse effects in I-10 region and Southern California Desert Region ■ Unavoidable adverse effects would occur CEQA: Environmentally Superior
Paleontological Resources	■ The geologic units have a moderate and high potential to contain vertebrate fossils and other paleontological resources. ■ Potential for indirect effects is high. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Same as Alternative B ■ Cumulative effects: contribute to the uncovering of fossils CEQA: Environmentally Inferior (same as Alts D and E)	■ Geologic formation underlying the alignment has a higher sensitivity than Alternative B. Severity of impacts would be somewhat greater. ■ The potential for indirect effects to paleontological resources is high. ■ Cumulative effects: contribute to the uncovering of fossils CEQA: Environmentally Inferior (same as Alts C and E)	■ Geologic formation underlying the alignment has an overall higher sensitivity than Alternative B. Severity of impacts to vertebrate fossils and other paleontological resources would be somewhat greater. ■ The potential for indirect effects to paleontological resources is also high. ■ Cumulative effects: contribute to the uncovering of fossils CEQA: Environmentally Inferior (same as Alts C and D)

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Fire and Fuels Management	■ Risk of wildfire related to the combustion of native plants caused by vehicles, equipment, or hazardous materials. Alternative would not generate greater impacts on fire and fuels as size difference is negligible and workforce and construction requirements identical across alternatives. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be substantially similar in its direct and indirect impacts to Alternative B ■ Cumulative effects: Project would contribute to risk of increased fire frequency CEQA: Environmentally Inferior (same as Alts D and E)	■ Alternative D would be substantially similar in its direct and indirect impacts to Alternative B ■ Cumulative effects: Project would contribute to risk of increased fire frequency CEQA: Environmentally Inferior (same as Alts C and E)	■ Alternative E would be substantially similar in its direct and indirect impacts to Alternative B ■ Cumulative effects: Project would contribute to risk of increased fire frequency CEQA: Environmentally Inferior (same as Alts C and D)
Soils and Geology	■ The larger size is negligible in terms of its impacts to soils and geology. Occurs in the same geologic setting as other alternatives, geologic hazards would present the same risks. Area not prone to erosion or involved in active sand transport ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Occupying the same ROW and following the same path, Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Environmentally Inferior (same as Alts D)	■ Alternative D occurs in the same geologic setting as the other alternatives, geologic hazards would present the same risks. Area not prone to erosion or involved in active sand transport. Specific route would not impact soils and geology. ■ Cumulative effects: contribute to wind and water erosion during construction CEQA: Environmentally Inferior (same as Alts C)	■ Alternative E occurs in the same geologic setting as the other alternatives, so geologic hazards would present the same risks. ■ Alternative E traverses an active Aeolian sand transport corridor and could temporarily impact sand transport depending on construction methods used (berms or stabilization). ■ Cumulative effects: contribute to wind and water erosion during construction. Contribute to the regionally-significant impact to the sand transport corridor. ■ Unavoidable cumulative impact to sand transport corridor. CEQA: Environmentally Inferior (worse than Alts C and D)

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Minerals and energy	■ Alternative would not generate greater impacts on mineral resources. Mineral requirements for construction would be negligibly different and the route does not impair access to mineral resources. Impacts identical across alternatives. ■ There would be no adverse cumulative effects. CEQA: Environmentally Equivalent	■ Alternative C would be identical in its impacts to Alternative B ■ There would be no adverse cumulative effects. CEQA: Environmentally Equivalent	■ Construction practices would be identical to Alternative B, and the size difference would be negligible. The specific alteration in route would not have an effect on mineral resource impacts. ■ There would be no adverse cumulative effects. CEQA: Environmentally Equivalent	■ Construction practices would be identical to Alternative B, and the size difference would be negligible. The specific alteration in route would not have an effect on mineral resource impacts. ■ There would be no adverse cumulative effects. CEQA: Environmentally Equivalent
Lands and Realty	■ Most of this alternative would be built on BLM land, County ROW, or private land, all of which allow for construction with proper permitting. ■ This alternative would traverse the Chuckwalla DWMA and CHU, but would represent a negligible fraction of allowable development in the area. ■ Would not affect agriculture. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B. ■ This alternative would traverse the Chuckwalla DWMA and CHU, but would represent a negligible fraction of allowable development in the area. ■ Alternative C ROW would extend into the Chuckwalla DWMA along Kaiser Road. No temporary or permanent ground disturbance in planned in the DWMA. ■ Alternative D would affect existing encumbrances. ■ Cumulative effects: project would minimally contribute to the conversion of land along the I-10 corridor CEQA: Environmentally Inferior	■ Alternative would be built on BLM land within Riverside County ROW both of which allow for construction with proper permitting. ■ A small portion of the southern tip of this alternative would traverse the Chuckwalla DWMA and CHU. ■ Alternative D would affect existing encumbrances. ■ Alternative D would cross 1.5 miles of private agricultural land (A-1-20) and would require proper permitting. A portion of this land would be Williamson Act Non-Prime Agricultural Land, but transmission lines are generally consistent and not detrimental to farmland uses. ■ Cumulative effects: project would minimally contribute to the conversion of land along the I-10 corridor CEQA: Environmentally Intermediate	■ Most of this alternative would be built on BLM land, or private land, all of which allow for construction with proper permitting. ■ A small portion of the southern tip of this alternative would traverse the Chuckwalla DWMA and CHU. ■ Alternative D would affect existing encumbrances. ■ This alternative would not affect any agricultural lands. ■ Cumulative effects: project would minimally contribute to the conversion of land along the I-10 corridor ■ There would be no unavoidable adverse effects. CEQA: Environmentally Intermediate

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Noise and Vibration	■ Nearest sensitive receptors are homes 500 feet away. Noise levels temporarily reach 62 dBA during construction. Increments would remain within the conditionally acceptable range. ■ Traffic would result in little noise effect in Desert Center due to the noise generated by traffic on I-10 but would result in a noticeable increase in traffic noise levels along Kaiser Road at Lake Tamarisk but would be within the conditionally acceptable range. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be nearly identical in its impacts to Alternative B. It would be slightly further from sensitive receptors (600 feet), and noise impacts would be slightly reduced compared to Alternative B. ■ Noise impacts as a result of traffic would be substantially the same as for Alternative B. ■ Cumulative effects: substantial cumulative noise effects from gen-tie construction would not occur. CEQA: Environmentally Inferior	■ Nearest sensitive receptors are homes 1,450 feet away. Noise levels would be slightly reduced compared to Alternative B. ■ Because of the increased distance between the construction of Alternative D and the truck traffic, noise levels would be slightly reduced. ■ Cumulative effects: substantial cumulative noise effects from gen-tie construction would not occur. CEQA: Environmentally Intermediate	■ Nearest sensitive receptors to this transmission route are homes approximately 900 feet away. Noise levels would be slightly reduced compared to those in Alternative B. ■ Because of the increased distance between the construction of Alternative D and the truck traffic, noise levels would be slightly reduced. ■ Cumulative effects: substantial cumulative noise effects from gen-tie construction would not occur. CEQA: Environmentally Intermediate

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Public Health and Safety	■ Alternative B would not generate greater impacts on public health and safety as the size difference is negligible, and workforce and construction requirements, which play the biggest role in creating impacts, would be identical across alternatives. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Roughly Environmentally Equivalent	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: impacts would be substantially the same as for Alternative B ■ There would be no unavoidable adverse effects. CEQA: Roughly Environmentally Equivalent	■ Construction and transportation practices would be identical to Alternative B, and the size difference would be negligible. Route would not have an effect on public health and safety impacts. ■ Cumulative effects: impacts would be substantially the same as for Alternative B ■ There would be no unavoidable adverse effects CEQA: Roughly Environmentally Equivalent	■ Construction and transportation practices would be identical to Alternative B, and size difference would be negligible. Route would not have an effect on public safety impacts. ■ Cumulative effects: impacts would be substantially the same as for Alternative B ■ There would be no unavoidable adverse effects CEQA: Roughly Environmentally Equivalent

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Recreation	■ Alternative would be 4.5 miles west of the nearest wilderness area. Noise and visual impacts would not be substantial. ■ Size of the alternative would not demand an increased workforce and would not affect use of recreational areas. ■ The alternative would not overlap or impede access to any OHV areas. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative Effects: The alternative would require a second set of towers for the gen-tie line and would increase the effects to the diminishment of the wilderness experience CEQA: Environmentally Inferior	■ The alternative is 4 miles from the nearest wilderness area. At this distance noise and visual impacts would not be significant. ■ The required workforce would not substantially change use of recreational opportunities in the vicinity. ■ The alternative would not overlap or impede access to any OHV areas. ■ Cumulative Effects: Would contribute to the diminishment of the wilderness experience CEQA: Environmentally Inferior	■ The alternative is 2.25 miles from the nearest wilderness area. At this distance noise and visual impacts would not be significant. Alternative is approximately 0.5 miles from the southern-most point of the Desert Lily ACEC. Visual impacts of Alternative E when viewed from the southern-most point of the Desert Lily ACEC would result in adverse and unmitigable impacts ■ The required workforce would not substantially change use of recreational opportunities in the vicinity. ■ The alternative would not overlap or impede access to any OHV areas. ■ Cumulative Effects: Would contribute to the diminishment of the wilderness experience ■ Unavoidable adverse effect to the recreational experience in proximal locations to the Desert Lily ACEC CEQA: Environmentally Inferior

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Social and Economic	■ The size difference between alternatives would be negligible and construction and workforce requirements would be the same across all alternatives ■ Alternative B would be almost fully on undisturbed public land potentially creating an impact to local quality of life. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: no adverse social or economic effects. CEQA: Environmentally Inferior	■ Construction and transportation practices would be identical to Alternative B and the size difference would be negligible. ■ The specific alteration in route would site a portion (1.5 miles) of Alternative D on previously disturbed private land, potentially increasing impacts to quality of life. ■ Cumulative effects: no adverse social or economic effects. ■ There would be no unavoidable adverse effects CEQA: Environmentally Inferior	■ Construction and transportation practices would be identical to Alternative B and size difference would be negligible. MWD land would be affected so this would minimize quality of life effects compared with Alt D. ■ Cumulative effects: no adverse social or economic effects. ■ There would be no unavoidable adverse effects CEQA: Environmentally Inferior
Environmental Justice	■ Construction is unlikely to disproportionately affect minority and low-income communities. ■ No contribution to cumulative effects No CEQA significance criteria for Environmental Justice	■ Alternative C would be identical in its impacts to Alternative B ■ No contribution to cumulative effects No CEQA significance criteria for Environmental Justice	■ Community makeup in the vicinity of this alternative is the same as in Alternative B, effects would be identical. ■ No contribution to cumulative effects No CEQA significance criteria for Environmental Justice	■ Community makeup in the vicinity of this alternative is the same as in Alternative B, effects of this alternative would be identical. ■ No contribution to cumulative effects CEQA: Environmentally Equivalent

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Special Designations	■ Located outside of DWMA except near Red Bluff Substation. ■ Would be visible from Joshua Tree Wilderness. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. No CEQA significance criteria for special designations.	■ ROW would extend 60 feet within the DWMA for entire north-south portion, but no ground disturbance expected. ■ Would be visible from Joshua Tree Wilderness. ■ Contributes to cumulative effects. No CEQA significance criteria for special designations.	■ Located outside DWMA except near Red Bluff Substation. ■ Would be visible from Joshua Tree Wilderness. ■ Contributes to cumulative effects. No CEQA significance criteria for special designations except agricultural and forestry resources.	■ Located within WHMA for several miles. ■ Located outside DWMA except near Red Bluff Substation. ■ Would be visible from Joshua Tree Wilderness and Desert Lily ACEC. ■ Contributes to cumulative effects. No CEQA significance criteria for special designations.
Transportation and Public Access	■ Alternative B would not result in a substantial increase in truck trips. Traffic would not reduce the existing LOS. ■ Alternative B would not result in adverse effects to air traffic obstruction and safety due to the distance between the alternative and the Desert Center Airport. Alternative B would overlap a low-level military flight path ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: Trips generated by Alternative C would combine with trips from other projects to reduce the LOS, but not to a less than acceptable level. Overall, not substantially adverse. CEQA: Environmentally Intermediate	■ Alternative D would not result in a substantial increase in truck trips and would not reduce the existing LOS. ■ Alternative D would be located 0.5 miles from an airport and coordination with the FAA would be prudent but not required. ■ Cumulative effects: Trips generated by Alternative C would combine with trips from other projects to reduce the LOS, but not to a less than acceptable level. Overall, not substantially adverse. CEQA: Environmentally Inferior	■ Alternative E would not result in a substantial increase in truck trips and would not reduce the existing LOS at the intersections. ■ Alternative E would not result in adverse effects to air traffic obstruction and safety due to the distance between the alternative and the Desert Center Airport. ■ Cumulative effects: Trips generated by Alternative C would combine with trips from other projects to reduce the LOS, but not to a less than acceptable level. Overall, not substantially adverse. CEQA: Environmentally Intermediate

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Visual Resource	■ Temporary visual effects due to construction equipment, materials, and workforce. ■ Alternative B would contribute to the conversion of natural desert landscapes to landscapes that substantially contrast with the natural character of the desert landscape ■ Strong long-term contrast to the existing landscape. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Temporary visual effects due to construction equipment, materials, and workforce. ■ Would result in a greater adverse effect from Kaiser Road because of the two transmission lines. ■ Alternative C would contribute to the conversion of natural desert landscapes to landscapes that substantially contrast with the natural character of the desert landscape ■ Strong long-term contrast to the existing landscape. ■ Cumulative effects: Only marginal contribution CEQA: Environmentally Inferior	■ Temporary visual effects due to construction equipment, materials, and workforce. ■ Would result in an adverse effect from Kaiser Road in the proposed project vicinity. ■ Strong long-term contrast to the existing landscape. ■ Cumulative effects: Only marginal contribution CEQA: Environmentally Intermediate (worse than C)	■ Temporary visual effects due to construction equipment, materials, and workforce. ■ Result in an adverse visual effect from SR-177 from a considerable distance. ■ Moderate to strong long-term contrast to the existing landscape. ■ Alternative E would contribute to the conversion of natural desert landscapes to landscapes that substantially contrast with the natural character of the desert landscape ■ Cumulative effects: Only marginal contribution CEQA: Environmentally Intermediate (worse than C and D)
Water Resources	■ Alternative B would require 6.25 afy of water for construction. Differences in water requirements for all alternatives would be insubstantial ■ Ground disturbance of Alternative B would introduce potential for soil erosion and sedimentation which could result in water quality degradation. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would occupy a ROW adjacent to Alternative B and require the same amount of water for construction. ■ Ground disturbance associated with construction of Alternative C would introduce the potential for soil erosion and sedimentation which could result in water quality degradation. ■ With implementation of mitigation, the Alternative C would not contribute to cumulative effects associated with groundwater supply and recharge. CEQA: Environmentally Inferior	■ Alternative D would be slightly shorter than Alternative B but would require a similar amount of water for construction. ■ Ground disturbance associated with construction of Alternative D would introduce the potential for soil erosion and sedimentation which could result in water quality degradation. ■ With implementation of mitigation, the Alternative D would not contribute to cumulative effects associated with groundwater supply and recharge. CEQA: Environmentally Inferior	■ Alternative E would be slightly shorter than Alternative B but would require a similar amount of water for construction. ■ Ground disturbance associated with construction of Alternative E would introduce the potential for soil erosion and sedimentation which could result in water quality degradation. ■ With implementation of mitigation, the Alternative E would not contribute to cumulative effects associated with groundwater supply and recharge. CEQA: Environmentally Inferior

Table 2-12. Comparison of Gen-Tie Action Alternatives

Environmental Discipline	Alternative B (92 acres)	Alternative C (92 acres)	Alternative D (86 acres)	Alternative E (85 acres)
Solid and Hazardous Wastes	■ Alternative would not generate greater solid and hazardous waste impacts as the size difference is negligible, and workforce and construction requirements would be identical across alternatives. ■ Cumulative impacts would not occur because construction of the Desert Sunlight gen-tie and Alternative B conductor stringing would use same crew at the same time. No additional work required for Alternative B. CEQA: Environmentally Superior	■ Alternative C would be identical in its impacts to Alternative B ■ Cumulative effects: Minimal contribution CEQA: Environmentally Inferior	■ Construction and transportation practices would be identical to Alternative B and the size difference would be negligible. Route would not have an effect on solid and hazardous waste impacts. ■ Cumulative effects: Minimal contribution CEQA: Environmentally Inferior	■ Construction and transportation practices would be identical to Alternative B and size difference would be negligible. Route would not have an effect on solid and hazardous waste impacts. ■ Cumulative effects: Minimal contribution CEQA: Environmentally Inferior

Table 2-13. Comparison of Solar Facility and Gen-Tie Action Alternative Combinations

Environmental Discipline	4-B	4-C	4-D	4-E	5-B	5-C	5-D	5-E	6-B	6-C	6-D	6-E	7-B	7-C	7-D	7-E
Air Resources	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Biological – Vegetation	3	4	4	5	3	4	4	5	1	2	2	2	1	2	2	2
Biological – Wildlife	3	4	4	5	3	4	4	5	1	2	2	3	1	2	2	3
Climate Change	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cultural Resources	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Paleontological Resources	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Fire and Fuels Management	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Soils	1	2	2	3	1	2	2	3	1	2	2	3	1	2	2	3
Minerals	2	3	3	3	2	3	3	3	1	2	2	2	1	2	2	2
Lands and Realty	2	3	3	3	2	3	3	3	1	2	2	2	1	2	2	2
Noise and Vibration	1	3	2	2	1	3	2	2	1	3	2	2	1	3	2	2
Public Health and Safety	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Recreation	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Social and Economic	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Environmental Justice	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Special Designations	1	2	2	3	1	2	2	3	1	2	2	3	1	2	2	3
Transportation and Access	1	2	3	2	1	2	3	2	1	2	3	2	1	2	3	2
Visual Resources	2	5	8	10	2	5	8	10	1	4	7	9	3	6	11	12
Water Resources	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2
Solid/Hazardous Wastes	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	2

Numerical codes and shades of gray are used to indicate the severity and magnitude of direct, indirect, and cumulative environmental effects within a row (but please note that severity and magnitude of effects should not be compared *between* rows, *i.e.*, between two different environmental resources). For NEPA, a lower number and a lighter shade represents a less severe and a smaller magnitude of adverse environmental effect. Numerical codes do not mean that quantitative analysis was performed, but instead indicate relative severity within each issue area. Many impacts were evaluated qualitatively.

Under Alternative 3-A, the proposed solar facility would not be approved, and a CDCA Plan Amendment would find the site unsuitable for large-scale solar energy development. With such an amendment, the project site would remain available for other types of uses allowable on BLM land, including mining, recreation, utilities, and traditional energy development. Compared with Alternative 1-A (which is also the CEQA "no project" alternative) and Alternatives 2-A and 3-A, Alternative 6-B would result in predictable unavoidable adverse direct, indirect, and cumulative effects on environmental resources in the Chuckwalla Valley and within the project study area, as summarized in Table 2-11 and 2-12, and described in Chapter 4.

2.15 AGENCY PREFERRED ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations at Title 40 Code of Federal Regulations (CFR) 1502.14(e) direct that an Environmental Impact Statement (EIS) must identify the agency's preferred alternative. The BLM has selected Alternative 7, High-Profile Reduced Footprint Solar Project, with Alternative B, Proposed Gen-Tie Line (Shared Towers), as the agency preferred alternative. Alternative 7 with Alternative B is the preferred alternative because it would be able to generate 125 to 135 MW and at least 260,000 MWh/yr of renewable energy on 1,044 acres, compared to 150 MW with 240,000 MWh/yr on 1,208 acres in the proposed solar facility. Alternative 7-B minimizes impacts resulting from ground disturbance and incorporating the use of shared facilities in an already designated transmission line ROW, while still responding to the BLM's purpose and need and partially meeting the applicant's objectives.

In order to have a complete project preference, the deciding official will choose one solar facility alternative and one gen-tie line alternative. For a complete action alternative, the deciding official could choose any one of the solar generation facility action alternatives, Alternatives 4 through 7, plus any one of the gen-tie action alternatives, Alternatives B through E.

The identification of a preferred alternative does not constitute a commitment or decision in principle, and there is no requirement to select the preferred alternative in the Record of Decision (ROD). Selection in the ROD of an alternative other than the preferred alternative does not require preparation of a supplemental EIS if the selected alternative was analyzed in the EIS, as long as the rationale for selecting the chosen alternative is explained.

An EIS must provide sufficient detail in the description of activities so that the effects of the Proposed Action may be compared to the effects of the alternatives, including the No Action Alternative (40 CFR 1502.14(b)). That comparison provides the clear basis for choice by the decision-maker. Section 2.14 provides a clear comparison among the alternatives, including among the individual solar facility alternatives, among the individual gen-tie alternatives, and among all combinations of alternatives. In addition, the alternatives are compared with the No Action Alternative and the two No Project alternatives. Section 2.16 also discloses the CEQA "environmental superiority" of alternatives; however, this information is provided for future use by CEQA Lead and Responsible Agencies, and is not required under NEPA.

2.16 CEQA ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The information in this section is provided for future use by CEQA Lead and Responsible Agencies, and is not required under NEPA.

CEQA Guidelines Section 15126.6 requires an Environmental Impact Report (EIR) to consider a range of reasonable alternatives to the proposed project, or to the location of the project, that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant impacts of the project, and evaluate the comparative merits of the alternatives. Because Riverside County intends to use this EIS in lieu of an EIR in determining whether to issue permits for the proposed gen-tie line or any of the gen-tie line alternatives, this section compares the gen-tie line alternatives evaluated in Chapter 4 of this EIS. In addition, because CEQA Guidelines Section 15278(a) requires the Lead Agency to consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect (*Citizens Assoc. For Sensible Development of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151), this chapter also compares the effects of the solar facility alternatives, the effects of all combinations of complete alternatives, identifies the environmentally superior action alternative, and compares this to the "CEQA no project alternative", which is a combination of Alternative 1 (No Action) and Alternative A (No Gen-Tie).

Per CEQA Guidelines 15126.6(e)(2), if the environmentally superior alternative is the "no project" alternative, an EIR must also identify an environmentally superior alternative among the other alternatives.

As demonstrated in Section 2.17.3, the overall environmentally superior alternative is the Alternative 1-A (No Action Alternative/No Gen-Tie Alternative combination). The environmentally superior alternative among the remaining action alternatives is Alternative 5-B (Reduced Footprint Alternative/Shared Gen-Tie combination).

As demonstrated in Table 2-13, the action alternative combination of solar facility Alternative 6 (Reduced Footprint Alternative) and gen-tie Alternative B (Proposed Gen-Tie Line [Shared Towers]) would result in the fewest and least severe adverse environmental effects overall. Alternative 6 combined with Alternative B, or Alternative 6-B, when compared with Alternative 1-A, which is also the CEQA "no project" alternative, would result in predictable unavoidable adverse direct, indirect, and cumulative effects on environmental resources in the Chuckwalla Valley and within the project study area. For purposes of CEQA, Alternative 1-A (the CEQA "no project" alternative) is the Environmentally Superior Alternative overall. Alternative 6-B is the CEQA environmentally superior action alternative.

2.17 ALTERNATIVES IDENTIFIED BUT ELIMINATED FROM DETAILED ANALYSIS

According to the Council on Environmental Quality's (CEQ) NEPA Regulations (40 CFR 1502.14), the alternatives section in an EIS shall rigorously explore and objectively evaluate all reasonable alternatives; however, for alternatives which were eliminated from detailed study, the EIS shall briefly discuss the reasons for their having been eliminated.

CEQ NEPA Regulations (40 C.F.R. 1502.13) require a statement "briefly specifying the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." As such, the ability of potential alternatives to achieve the project's purpose and need is one of the criteria used to evaluate alternatives. NEPA allows consideration of alternatives that meet "most" of the project's purpose. As noted in the findings for *Natural Resources Defense Council v. Morton* (458 F.2d 827 [D.C. Cir. 1972]), "Nor is it appropriate to disregard alternatives merely because they do not offer a complete solution to the problem." The Applicant's search for a suitable site began with an evaluation of the project's purpose and

need, which is fundamentally to construct, operate, maintain, and eventually decommission a 150-MW solar energy facility and associated interconnection transmission infrastructure to help meet federal and state renewable energy supply and greenhouse gas (GHG) emissions reduction requirements.

The applicant's objectives, presented in Section 1.3, help guide the BLM's development of alternatives. Consistent with CEQ's NEPA Regulations and applicable BLM policies (e.g., NEPA Compliance for Utility-Scale Renewable Energy ROW Authorizations (IM 2011-059; BLM 2011)), the alternatives below were not carried forward for additional analysis because they:

- Did not meet BLM's purpose and need;
- Were determined to be practically or technically infeasible (as informed by the Applicant's interests and objectives);
- Would have substantially similar effects to an alternative that is analyzed; or
- Would have resource conflicts associated with an identified alternative.

Consistent with CEQA requirements, the BLM assessed the alternatives below to determine whether each had greater environmental impacts than the project alternatives, based on knowledge of the project area.

2.17.1 Alternative to Facilitate Wildlife Movement

The U.S. Fish and Wildlife service suggested consideration of an alternative that was designed to facilitate wildlife movement in the Chuckwalla Valley. The eastern boundary of the project site contains two 40-acre parcels of BLM-managed lands that extend 0.25 miles east toward Beekley Road (Township 4S Range 15 E Section 25 NENE and S ESE). These two parcels further constrict the narrow movement corridor along the easternmost boundary of the project site. This corridor consists of both privately owned and BLM-managed lands between the project site and the agricultural lands further east. The corridor ranges from 0.2 miles wide to 0.5 miles wide. An alternative was suggested that would require the applicant to remove the two BLM-managed parcels from the site plan to maximize the width of this movement corridor to allow for north-south movement for wildlife, especially desert tortoise. The alternative would require a permanent conservation easement to be applied to the corridor, and for BLM to identify this area as unsuitable for future solar development to ensure that this linkage corridor remains unobstructed.

The BLM considered the suggested alternative; however, although desert tortoise habitat occurs east of the DHSP site, this habitat does not provide a movement corridor. A state-wide evaluation of habitat connectivity (Spencer et al. 2010) includes the upper Chuckwalla Valley, including the project site and surrounding areas, among areas identified as "Essential Connectivity Areas." The report describes these as follows: "Essential Connectivity Areas are placeholder polygons that can inform land-planning efforts, but that should eventually be replaced by more detailed Linkage Designs, developed at finer resolution based on the needs of particular species and ecological processes" (p. xiii). In Chapters 4 and 5, Spencer et al. (2010) provide "frameworks" for regional and local scale connectivity analysis. Following these recommendations, BLM contracted researchers involved in the state-wide evaluation to conduct regional and local analyses across the desert, including this area. Preliminary results indicate that the critical connectivity area lies to the west of the proposed project site along the east side of Eagle Mountains (Fesnock pers com).

In addition to the study addressed above, the proposed project site was analyzed for its wildlife connectivity importance. The proposed solar facility site is located roughly midway between the three mountain ranges that surround the upper Chuckwalla Valley. It is adjacent to a small (an estimated 40-acre) date palm orchard near its southeastern corner; about 1 mile north of agricultural lands on about 1,000 acres; and about 0.25 miles west of another large agricultural tract, also covering about 1,000 acres. "Corridor passage" species, such as large mammals would likely use the agricultural lands for passage. Disused agricultural lands may also be suitable for some "dweller" species, including small mammals and reptiles, but are poorly suited for desert tortoises. Thus, due to the poor quality of habitat on the proposed project site, the fragmented and disturbed landscape surrounding the site, and the low tortoise sign at the proposed project site, this area would not be considered suitable for tortoise "dwelling" in high enough densities to suggest that the project site support generational connectivity. Without the ability to support sufficient populations, this area would not be considered critical for tortoise connectivity, and therefore, may only provide some minimal support for regional wildlife connectivity.

Conclusion. Because the critical wildlife connectivity area lies west of the project and not east of the project and because the proposed project site provides only minimal support for regional connectivity, the proposed alternative would not serve the purpose of improving connectivity and was eliminated from detailed analysis.

2.17.2 Alternative Sites

Several alternative sites were considered for locating the project on public and private lands. The alternatives described below were eliminated from detailed analysis.

Private Land within the Chuckwalla Valley

Scoping comments recommended use of private lands outside of the jurisdiction of the lead agency as alternatives. Private lands within Chuckwalla Valley were considered for siting the proposed solar energy project; however, the BLM has no jurisdiction over the siting of the project on private land.

The first site that was identified, Desert Center West, is 4 miles west of the community of Desert Center. This site consists of 44 semi-contiguous parcels totaling approximately 4,000 acres and owned by 36 separate owners. The average size of the parcels is 160 acres.

The second private site eliminated from further consideration is Desert Center East, located 7.5 miles east of the community of Desert Center. This site consists of 14 parcels totaling approximately 1,800 acres. The average parcel size is 160 acres.

A third private site, Desert Center Central, lies south of the project study area, 3.5 miles northeast from the community of Desert Center, and consists of mostly disturbed agricultural land. This site is transected by an existing SCE 161 kV transmission line. Some of the land is subject to conservation contract under the Williamson Act (California Land Conservation Act of 1965), potentially preventing current solar development on those parcels. Much of this site is currently undergoing environmental review by Riverside County for use as a solar project and therefore would not be available as part of an alternative for the Applicant. The site contains 464 different parcels, owned by 228 owners.

The private land described above would have the technical potential to be developed for solar energy. However, the private land alternative would require use of semi-contiguous parcels as well as the aggregation of numerous parcels owned by numerous separate individuals. Due to the small parcels and scattered ownership, it would be difficult and expensive, if not impossible, to acquire sufficient contiguous acreage necessary to support the project, making a private land alternative technically and economically infeasible. In addition, under NEPA a private land alternative does not respond to BLM's purpose of and need for the proposed project, namely, to consider an application for the authorized use of public lands for a solar facility, which could include requesting modifications to the proposal that are within BLM's jurisdiction.

Contaminated Sites near the Devers-Palo Verde Corridor

Scoping comments recommended use of degraded and contaminated sites as alternatives. The EPA's Renewable Energy Interactive Mapping Tool was used to identify contaminated and potentially contaminated Renewable Energy Sites for PV Utility Solar facilities. There were only two sites in the general region of the Devers-Palo Verde line. A 43-acre site identified as "Square D Company" is located in Beaumont, California, 20 miles west of the Devers Substation. A second 35-acre site, "Woten Aviation Services Inc.," is located 7 miles southwest of Blythe, California, and 5 to 10 miles from the proposed Midpoint Substation. Both sites are part of the Resource Conservation and Recovery Act (RCRA) program.

As with the private land alternatives described above, it would be technically possible to develop solar energy on the contaminated sites. However, the aggregated sites would not be sufficiently large enough to support a 150 MW project. Due to the limited number of contaminated parcels near the Devers-Palo Verde Corridor, it would be impossible to acquire sufficient contiguous or semi-contiguous contaminated acreage for the project, making a contaminated land alternative technically and economically infeasible.

Alternative BLM-Administered Land

Much of the BLM-administered land in Riverside County with the highest solar energy production potential is precluded from development by special designations such as areas of critical environmental concern (ACEC), DWMA, wilderness, and other designations (BLM 2012). Additionally, from the Chuckwalla Valley east toward Blythe along the I-10 corridor, most of the BLM administered lands that are not precluded by such resource conflicts is already subject to first-in-time applications by other solar projects for ROW, which would take priority over the proposed project.

Moreover, even if the BLM-administered land along the I-10 corridor to be available, it could require a different interconnection point to the California grid from the proposed project, and therefore an alternative location would require a new interconnection application, which would re-start the CAISO interconnection process; delaying the project for several years.

Conclusion. Combined the considerations identified above mean that an alternative location on BLM-administered lands would not be economically feasible.

2.17.3 Alternate Solar Technologies

The BLM will not typically analyze an alternative for a different technology when a ROW application is submitted for a specific technology (e.g., evaluate a concentrated solar power applica-

tion for a solar photovoltaic application) because such an alternative does not respond to the BLM's purpose and need to consider an application for the authorized use of public lands for a specific renewable energy technology. However, all technologies considered by the BLM and the applicant during the pre-application process, and the rationale why they were not pursued by the agency and/or the applicant should be summarized in the NEPA document as done below (IM No. 2011-061).

Solar Trough Technology. A parabolic trough system converts solar radiation to electricity by using sunlight to heat a fluid, such as oil, which is then used to generate steam. The plant consists of a large field of trough-shaped solar collectors arranged in parallel rows, normally aligned on a north-south horizontal axis. Each parabolic trough collector has a linear parabolic-shaped reflector that focuses the sun's direct beam radiation on a linear receiver, also referred to as a heat collection element located at the focus of the parabola. Heat transfer fluid within the collector is heated to 740°F as it circulates through the receiver and returns to a series of heat exchangers where the fluid is used to generate high-pressure steam. The superheated steam is then fed to a conventional reheat steam turbine/generator to produce electricity. On average, 5 to 8 acres of land are required per MW of power generated.

Solar Power Tower Technology. The solar power tower technology converts thermal energy to electricity by using heliostat (mirror) fields to focus energy on a boiler located on power tower receivers near the center of each heliostat array. Each mirror tracks the sun during the day. Existing heliostats are 7.2 feet high by 10.5 feet wide. The solar power towers can be up to 600 feet tall with additional 10-foot-tall lightning rods. The solar power tower would receive heat from the heliostats then convert the heat into steam by heating water in the solar boilers. A secondary phase would convert the steam into electricity using Rankine-cycle reheat steam turbine electric generator housed in a power block facility at each of the plants. In general, a solar power tower power plant requires 5 to 10 acres of land per MW of power generated.

Linear Fresnel Technology. A solar linear Fresnel power plant converts solar radiation to electricity by using flat moving mirrors to follow the path of the sun and reflect its heat on the fixed pipe receivers located about the mirrors. During daylight hours, the solar concentrators focus heat on the receivers to produce steam, which is collected in a piping system and delivered to steam drums located in a solar field and then transferred to steam drums in a power block. The steam drums transferred to the power block will be used to turn steam turbine generators and produce electricity. The steam is then cooled, condensed into water, and recirculated back into the process. In general, the linear Fresnel technology requires 4 to 5 acres of land per MW of power generated.

Conclusion. Although the alternative solar generation technologies would achieve most of the project objectives, each would have different environmental or feasibility concerns. In particular, these technologies would require similar amounts of land as the project, resulting in similar impacts on biological and cultural resources, and land use, however, the all generally would have greater potential impacts on water use and visual impacts because of towers or other structural features that would be much more visible than those for a PV project. In addition, the technologies are not within the Applicant's area of expertise, and would require a new Plan of Development and all associated studies which would re-start the process; delaying the project for several years. Combined these factors mean that an alternative technology would not be economically or technically feasible.

2.17.4 Distributed and Rooftop Photovoltaics

Scoping comments recommended use of distributed and rooftop PV systems as an alternative. A distributed solar alternative would consist of PV panels that would absorb solar radiation and convert it directly to electricity (similar to the Applicant's technology and all PV technologies). The PV panels could be installed on private or publicly owned residential, commercial, or industrial building rooftops or in other disturbed areas such as parking lots or disturbed areas adjacent to existing structures such as substations. To be a viable alternative to the project, there would have needed to be sufficient newly installed panels to generate 150 MW of capacity.

California currently has over 900 MW of distributed PV systems at 94,891 individual sites (CPUC 2011). During 2010, 194 MW of distributed PV was installed in California and more than 110 MW of solar have already been installed under the CSI Program through June 14, 2011 (CPUC 2011). Yet at this rate of installation, achievement of the California Renewables Portfolio Standard would be delayed well beyond the 2020 deadline. There would have to be a significant acceleration of installation of both distributed and nondistributed generation to meet the goals defined in California's RPS. Large-scale projects play an important role in meeting these goals.

Additionally, current research indicates that development of both distributed generation and utility-scale solar power will be needed to meet future energy needs in the United States, along with other energy resources and energy efficiency technologies (NREL 2010). For a variety of reasons (e.g., upper limits on integrating distributed generation into the electric grid, costs, lack of electricity storage in most systems, and continued dependency of buildings on grid-supplied power), distributed solar energy alone cannot meet the goals for renewable energy development. Ultimately, both utility-scale and distributed generation solar power will need to be deployed at increasing levels, and the highest penetration of solar power overall will require a combination of both types (NREL 2010).

Therefore, alternatives involving distributed generation were eliminated from detailed analysis because it does not respond to the BLM's purpose and need for the Proposed Action, which is to respond to the Applicant's application for a ROW grant to construct, operate, and decommission a solar photovoltaic facility on public lands in compliance with FLPMA, BLM ROW regulations, and other federal applicable laws consistent with the Energy Policy Act of 2005's goal that the Secretary of the Interior approve 10,000 MW of non-hydropower renewable energy projects located on public lands by 2015. The objectives cannot be achieved on that timetable through distributed generation systems. Therefore, BLM's purpose and need for agency action in this EIS is focused on the siting and management of utility-scale solar energy development on public lands. Furthermore, the BLM has no authority or influence over the installation of distributed generation systems, other than lands that it administers. Based on the foregoing, this alternative was not carried forward for further review.

2.17.5 Alternate Renewable Technologies

Wind Energy. Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feed AC into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. A single 1.5 MW turbine operating at a 40 percent capacity factor generates 2,100 megawatt-hours annually. Wind turbines currently being manufactured have power ratings

ranging from 250 watts to 5 MW, and units larger than 7 MW in capacity are now under development (EERE 2008). The technology is well developed and can be used to generate significant amounts of power. California has 3,179 MW of installed wind capacity as of 2010 (AWEA 2011).

The use of wind energy at the project locations may be feasible at the scale of the project but it would not eliminate significant impacts caused by the project; specifically, there would still be impacts on biological and cultural resources, and visual effects would be greater than with the proposed project. Furthermore, the project site is not viable for commercial wind energy production (BLM 2005).

Geothermal Energy. Geothermal technologies use steam or high-temperature water obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor dominated resources (dry, super-heated steam) and liquid-dominated resources where various techniques are used to extract energy from the high-temperature water. Geothermal plants account for 5 percent of California's power and range in size from under 1 MW to 200 MW. California is the largest geothermal power producer in the United States, with about 1,800 MW installed capacity; in 2007, 13,000 gigawatt hours of electricity were produced in California (CEC 2008). Geothermal plants provide highly reliable baseload power, with capacity factors from 90 to 98 percent.

The use of geothermal energy at the project locations would be unfeasible as there are no geothermal reservoirs at this location.

Biomass Energy. Biomass generation creates electricity by burning organic fuels in a boiler to produce steam, which then turns a turbine. Biomass can also be converted into a fuel gas such as methane and burned to generate power. Wood is the most commonly used biomass for power generation. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Several techniques are used to convert these fuels to electricity, including direct combustion, gasification, and anaerobic fermentation. Biomass facilities do not require the extensive amount of land required by the other renewable energy sources discussed, but they generate much smaller amounts of electricity. Most biomass plant capacities are in the 3 to 10 MW range. Unlike other renewables, the locational flexibility of biomass facilities would reduce the need for significant transmission investments. California has a total of 968 MW of existing and planned biomass generation (CEC 2008).

Conclusion. The use of biomass energy at the project location would be unfeasible as there are no biomass sources at or nearby this location.

2.17.6 Non-Renewable Technologies

Natural Gas. Natural gas power generation accounts for 22 percent of all the energy used in the United States and comprises about 46 percent of the power generated in California (CEC 2009). Natural gas power plants typically consist of combustion turbine generators, heat recovery steam generators, a steam turbine generator, wet or dry cooling towers, and associated support equipment. An interconnection with a natural gas pipeline, a water supply, and electric transmission are also required.

Coal. Coal-fired electric generating plants are the cornerstone of America's central power system. Traditional coal-fired plants generate large amounts of greenhouse gases. New "clean coal technology" includes a variety of energy processes that reduce air emission and other pollutants from coal-burning power plants. The Clean Coal Power Initiative is providing government co-financing for new coal technologies that help utilities meet the Clear Skies Initiative to cut sulfur, nitrogen, and mercury pollutants by nearly 70 percent by 2018.

In 2008, 18.2 percent of the energy used in California came from coal fired sources(CEC 2009). The in-state coal-fired generation includes electricity generated from out-of-state, coal-fired power plants owned by and reported by California utilities. In 2006, California enacted SB 1368 (Perata, Chapter 598, Statutes of 2006), which prohibits utilities from making long-term commitments for electricity generated from plants that create more carbon dioxide (CO_2) than clean-burning natural gas plants (CEC 2009).

Nuclear Energy. Generation from nuclear power plants represented 44,268 gigawatt-hours of California's total system power in 2008 (CEC 2009). However, California has a moratorium on building new nuclear power plants until a means for the permanent disposal or reprocessing of spent nuclear fuel has been demonstrated and approved in the United States. In 1978, the Energy Commission found that neither of these conditions had been met. In 2005, the Energy Commission reaffirmed these findings and also found that reprocessing remains substantially more expensive than waste storage and disposal and has substantially adverse implications for nuclear nonproliferation efforts. (CEC 2009) It should also be noted that the permitting of new nuclear facilities in California is currently illegal, so this technology also is eliminated as infeasible.

Conclusion. Alternative methods of generating electricity, such as natural gas, coal, and nuclear energy, were eliminated from detailed discussion because they would be too great a departure from the application to be considered a modification of the Applicant's proposal, and so are inapplicable under NEPA. These alternative generation technologies would not respond to the BLM's purpose and need for the Proposed Action, which is to respond to the Applicant's application for a ROW grant to construct, operate, and decommission a solar photovoltaic facility on public lands in compliance with FLPMA, BLM ROW regulations, and other federal applicable laws. Additionally, none of these alternative methods of generating electricity is within the Applicant's area of expertise; therefore, it would not likely be technically or economically feasible for the Applicant to implement them.

2.17.7 Conservation and Demand-side Management

Conservation and demand-side management consist of a variety of approaches to reduction of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. The California Public Utilities Commission (CPUC), with support from the Governor's Office, the Energy Commission, and the California Air Resources Board, among others, adopted the California Long-Term Energy Efficiency Strategy Plan for 2009 to 2020 in September 2008 (CPUC 2008). The plan is a framework for all sectors in California including industry, agriculture, large and small businesses, and households. Major goals of the plan include:

- All new residential construction will be zero net energy by 2020;
- All new commercial construction will be zero net energy by 2030;

- Heating, ventilation, and air conditioning industries will be re-shaped to deliver maximum performance systems;
- Eligible low-income customers will be able to participate in the Low Income Energy Efficiency program and will be provided with cost-effective energy efficiency measures in their residences by 2020.

As noted in the California Energy Commission *2009 Integrated Energy Policy Report*, California's renewable energy goals are based on a percentage of retail sales of electricity. Reducing overall electricity demands means fewer retail sales and therefore less renewable energy that must be generated and fewer renewable plants will need to be built. However, conservation and demand-side management will not itself provide the renewable energy required to meet the California renewable energy goals.

Conclusion. Conservation and demand-side management are eliminated from detailed discussion because they would be too great a departure from the application to be considered a modification of the Applicant's proposal, and so are inapplicable under NEPA. This alternative would not respond to the BLM's purpose and need for the Proposed Action, which is to respond to the application for a ROW grant to construct, operate, and decommission a solar photovoltaic facility on public lands in compliance with FLPMA, BLM ROW regulations, and other federal applicable laws. Conservation and demand-side management would also not respond to the purpose and need to address the Energy Policy Act of 2005's goal for the Secretary of the Interior to approve 10,000 MW of non-hydropower renewable energy projects located on public lands. Moreover, the BLM has no jurisdiction over conservation and demand-side management programs. Finally, accounting for population growth and the associated increasing in the demand for energy, there is no evidence that conservation and demand-management alone would be sufficient to address all of California's energy needs.[4]

2.17.8 Underground Installation of gen-tie line

An underground installation of the gen-tie line would install the line underground rather than overhead. This was considered because the overhead lines would be highly visible. Underground transmission lines at 230 kV have been installed or are planned to be installed in California by Pacific Gas & Electric Company (its Northeast San Jose, Tri-Valley, and Jefferson-Martin projects) and by San Diego Gas & Electric Company (its approved Otay Mesa and Sunrise Powerlink projects). These lines, or portions of them, have been installed underground either due to congested urban areas where there is inadequate space for overhead high-voltage lines, or (in the case of Tri-Valley and Jefferson-Martin) to reduce visual impacts in scenic areas.

Environmental Impacts. While underground lines would reduce the visual effects of the transmission lines, they have several disadvantages with respect to the environmental impacts that would occur during construction. Substantial ground disturbance is required to install the trench and cables for underground transmission lines. Of the total length of gen-tie line Alternatives (approximately 30 miles combined for all three route alignments) illustrated in Figure 2-1 in Appendix A, about 6 miles would parallel a paved roadway (Kaiser Road, parallel to the Alterna-

[4] 2011 Integrated Energy Policy Report Lead Commissioner Draft (December 2011) discusses cost-effective energy efficiency in Chapter 2.

tive B&C alignment). This 6-mile segment could likely be installed within the paved portion of this road with minimal disturbance of desert habitat, but the remainder of the route would be installed in dirt roads or in undisturbed desert.

The trench for a 230-kV line could vary from about 3 feet to 6 feet wide depending on the configuration of the cables within the trench. A construction work area from 25 to 50 feet wide is required parallel to the trench for construction equipment, resulting in temporary disturbance to habitat. In unpaved areas, the area above the trench (generally a 20- or 25-foot-wide road) would have to remain clear and accessible for the life of the project, a permanent loss of habitat.

The environmental impacts of installing underground transmission lines have been defined in detail in several completed CPUC environmental impact reports (EIRs) including the following, all of which included underground segments that have been constructed:

- PG&E Jefferson-Martin 230 kV Transmission Project (Application A.02-09-043, approved in CPUC Decision D.04-08-046);
- PG&E Tri-Valley Capacity Increase Project (Application A.99-11-025, approved in CPUC Decision D.01-10-029);
- SDG&E Otay Mesa Power Purchase Agreement Transmission Project (Application A.04-03-008, approved in CPUC Decision D.05.06.061); and
- SDG&E Sunrise Powerlink Transmission Project (Applications A.05-12-014 and A.06-08-010, approved in CPUC Decision D.08-12-058).

Other CPUC EIRs have evaluated underground transmission line segment alternatives and rejected them for a variety of reasons, including their potential for environmental impacts (e.g., Miguel-Mission 230 kV #2 project, A.02-07-022, Final EIR, June 2004). As explained in those documents, the impacts resulting from construction or operation of underground transmission lines include the following:

- Biological resources would be affected by loss of habitat due to construction required outside of paved roadways. The loss of desert tortoise habitat, and habitat for other species, would be substantially greater than that lost for overhead transmission line construction.
- There would be a substantially greater likelihood of encountering subsurface cultural resources.
- Air emissions would be greater due to the construction equipment required to construct a continuous trench, the dust from trenching and more trucks driving on unpaved roads, and increased truck trips to haul trench spoils and import thermal back-fill.
- Construction noise would be increased, both in time and severity.
- Traffic impacts would be greater because additional vehicles would be required to haul trench spoils and import back-fill. Construction in Kaiser Road would require closure of at least one lane.

Cost, Expansion, and Maintenance. First Solar provided a report entitled "Gen-Tie Undergrounding Report; Desert Sunlight Solar Farm Project" (First Solar 2011) which analyzed the costs associated with undergrounding the transmission line for that Project. The costs identified in that report would be similar for the DHSP's gen-tie line. This report, which summarized underground installations in the U.S. and presented a potential design for a First Solar under-

ground gen-tie, identified several concerns that would also be relevant to the DHSP project, related to cost, limits on expansion, and accessibility, as described below.

Cost is also a major concern to the developer, since construction of underground transmission lines costs up to 8.5 times more than overhead lines. Increased costs would negatively affect a project's financial viability, especially when coupled with the considerable technical and environmental risks involved with underground transmission line design.

The First Solar report also stated that expansion of the capacity of a transmission line, or addition of future circuits, would be more difficult if underground lines were installed. The addition of future circuits could be accommodated by increasing cable spacing or constructing a larger duct bank (leaving empty spaces for future cables), or by constructing a parallel duct bank separated by an adequate distance to allow heat dissipation. However, these approaches would further increase construction cost.

Underground transmission lines are less accessible than overhead lines, so line maintenance is more challenging. It is more difficult to know where an outage has occurred, so outages of an underground line can be more time-consuming both to find the problem and to repair it. Third-party construction damage to the buried facilities is also a concern, as it is for underground utility infrastructure of all kinds.

Conclusion. BLM evaluated the information included in First Solar's report and determined that, based on the Agency's own experience, expertise, and research, constructing the adjacent Desert Sunlight Solar Farm's gen-tie lines underground would not be feasible. Although the technology for underground transmission lines is available and has been used to reduce visual impacts and to avoid overhead construction through congested areas by major utilities in California, the increased environmental impacts that would result to other resource areas does not justify the construction of underground lines. Those the same conclusions hold true for the DHSP. Specifically, the lack of adequate paved roadways for installation of the gen-tie lines serving the DHSP would result in substantially greater impacts to biological resources, cultural resources, air quality, and noise than for the overhead gen-ties. The additional costs and technical risks associated with underground lines also make it undesirable under these conditions. As a result, the underground gen-tie alternative has been eliminated from detailed consideration.

2.17.9 Transmission Corridor Alternative

The gen-tie alternatives are located within the CDCA Planning area in Multiple Use Classes L and M. Within Multiple Use Classes L and M, the CDCA Plan 1980, as amended allows for transmission lines above 161 kV within designated corridors. Designated planning corridors were identified in the CDCA Plan 1980, as amended. Planning corridors are a tool for guiding the necessary detailed planning and environmental assessment work which will continue to be required where a right-of-way is requested. Sites associated with power generation or transmission not identified in the Plan will be considered through the Plan Amendment process.

If a new transmission line is proposed that is above 161 kV, it will be considered through the Plan Amendment process. The BLM could either amend the CDCA Plan to designate a new corridor or the CDCA Plan could be amended to 'allow' the individual transmission line outside a corridor. A new joint-use corridor varies in width from two to five miles and would address new

electrical transmission towers and cables of 161 kV or above, pipelines with diameters greater than 12 inches, coaxial cables for interstate communications, and major aqueducts or canals.

Conclusion. The BLM considered designation of a joint-use corridor from the proposed solar facility site to the designated utility corridor that runs along the I-10. This would be a 5.4-mile long corridor. However, as noted in the CDCA Plan 1980, as amended, utility planning corridors specifically address utility facilities constructed for the purposes of bulk transfer of electricity and other commodities. Because the transmission line required for the DHSP project would be used for one solar project, sufficient bulk energy transfer would not occur to warrant the designation of a utility corridor.

2.17.10 Higher Mounted Panels Alternative

A commenting agency recommended that the EIS include an alternative that would mount panels at a height to eliminate the need for vegetation clearing and would maintain natural vegetation. While mitigation to protect, maintain, and restore native vegetation is described in Section 4.3, no alternative PV technology, mounting system, or mounting height was identified by the EIS preparers that could achieve permanence of appreciable amounts of native vegetation on the solar project site. Even with PV panels mounted at a height to eliminate vegetation clearing, they would impact the desert environment due to substantial shading of the site by such panels.

Conclusion. Based on the foregoing, this alternative was not carried forward.